



United States
Department of
Agriculture



Forest Service
Northern Region

ENVIRONMENTAL IMPACT STATEMENT VOL. II - APPENDICES

FOREST PLAN



Clearwater National Forest

Orofino, Idaho
September, 1987

APPENDICES TO THE
ENVIRONMENTAL IMPACT STATEMENT
VOL II
Clearwater National Forest

September 1987

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Appendix A

Issues and Concerns

I. INTRODUCTION

This appendix describes the process used to identify the issues, concerns, and opportunities which are addressed in the Forest planning process. The agencies and individuals with whom the Forest consulted in the process are also listed along with a summary of the discussion with each. The third portion of the appendix presents the major issues that were selected to be addressed in the Forest Plan.

The process to identify issues began in early 1979 by holding meetings at the District Ranger offices to acquaint employees with the new process and to identify management concerns. These concerns were explored on a field trip to observe some of the management concerns on-the-ground and to reach agreements on the best way to approach them in the Forest Plan. Then various teams composed of managers were formed to consider ways to address the identified concerns.

In October 1979 a Notice of Intent to prepare a Forest Plan and Environmental Impact Statement was published in the Federal Register. A Public Involvement Plan to implement the planning process was also approved.

Also in October, a letter was mailed to persons who previously indicated an interest in land management planning of the Clearwater National Forest. A brochure was developed and distributed by the three North Idaho Forests about the new planning process. Shortly thereafter, a news release announced the dates for the public workshops.

About the same time, a group of Supervisor's Office employees met to test the use of the nominal group technique, a structured process used for public workshops. This group generated 22 issue statements.

A total of 210 people attended workshops in Moscow, Lewiston, Orofino, and Kamiah that November. Participants at the workshops were asked to identify and then rate, using the nominal group technique, what they considered to be the issues facing the Clearwater National Forest. They were encouraged to comment on aspects of management which they considered needed changing now or in the future or to comment on aspects which they thought were okay. A total of 680 issue statements were generated at the four workshops.

Briefly, the analysis and evaluation of those statements were conducted by first coding the 680 statements and then sorting them into major topic areas. Identical and near identical statements were then combined. In conjunction with the initial screening process, the intensity and distribution of each issue was recorded. The purpose of this was to determine the relative importance of each issue, and to get an idea of the distribution of participants.

The initial screening process resulted in thirty-three major topic statements plus a number of individual issues which did not fit into these major topics. These remaining issues were evaluated and placed into one of three categories: 1) to be addressed in the EIS and Forest Plan, 2) to be addressed in the EIS and Forest Plan because of explicit direction in the National Forest Management Act regulations, and 3) to be addressed through some other means because they were outside the scope of the forest planning process.

As a result of this screening, fifteen major topic issues were identified. In addition to the major issue statements, a number of issue-related-questions were determined to be important and unique enough to the Clearwater to list them specifically under the major topic.

An analysis was then done to assure that no former issues identified in past activities and correspondence were not ignored. After this further probing, these fifteen major ICO's became the driving force behind the development of the DEIS and Proposed Plan.

The public was notified by letters of the planning progress in February and May of 1980 and again in June 1982. During this time, various presentations were made at different meetings about the planning process. In addition, individuals who expressed interest were mailed copies of the preliminary documents (the Analysis of Management Situation and Forest Plan Alternatives).

Additional public involvement was initiated in September, 1983 to aid in resolution of the roadless designation questions. Prior to this time, Forest planning efforts had examined a broad range of uses for roadless areas but had not included an evaluation for wilderness designation. The Forest Service had relied on earlier evaluations and recommendations made in the RARE II (Roadless Area Review and Evaluation) final EIS. After the Ninth Circuit Court decision on the RARE II EIS, the NFMA regulations (219.7) were revised to include an evaluation of roadless areas for wilderness in the Forest Planning process.

In February 1985, notification of the impending release of the documents was sent to private land owners whose lands border the Clearwater or who are dependent on the Clearwater for access. These land owners were specifically invited to comment on the draft documents during the public review.

The Draft Environmental Impact Statement and Proposed Forest Plan became available to the public in May 1985 for a 120-day review and comment period which ended on September 15, 1985. Newspaper articles appeared in local papers to announce the release of the documents.

Over 600 original copies of the Proposed Forest Plan were sent to individuals, organizations and agencies; 500 copies of the DEIS; 500 copies of Appendices to the DEIS; and over 1,000 copies of the Overview. By the end of May, most of the original documents were gone. During the next two years, the Forest had to make many copies of the documents to meet the demand for the documents.

The Forest conducted open houses during June and July 1985 at Orofino, Kamiah, Lewiston, Spokane, Moscow, Boise, and Missoula. The meetings allowed more than 300 individuals to ask specific questions about the proposed plan to resource specialists, planners, and managers.

Forest personnel spent an extensive amount of time meeting with various groups and agencies from the time the draft documents were released until April 1987. Over 90 meetings were conducted; often personnel met with the same group more than once. For a complete list of meetings, see Section II of this appendix. Besides these meetings, contacts were also made by phone and by letters.

By the end of the public review, 3244 letters/forms, 16 oral statements, and 30 reports had been received. (Approximately 35 comments were received after the September 15 deadline, and although they were coded and entered in the computer, they were not evaluated with the rest of the comments.)

Most of the responses were on "response forms" of which there were two main types. One was the "Crisis Rally Form," which was given to participants at a Crisis Rally sponsored by the North Idaho Chamber of Commerce in Orofino in August 1985. The Crisis Rally was held to draw attention to the plight of logging communities after Potlatch Corporation announced that it would close two of its lumber mills. The other response form came from the St. Maries area, and was sponsored by the St. Joe Valley Association. These two forms accounted for 2435 responses.

The Clearwater Forest received responses from the following locations:

Clearwater County	622
Idaho County	69
Latah County	98
Nezperce/Asotin Counties	500
Other North Idaho	1,265
South Idaho	198
Spokane Area	167
Other WA State	112
Montana	26
Oregon	13
All Other	91
No Return Address	129

The largest number of responses came from "Other North Idaho" category. All but a small percentage of those came from the St. Maries, Idaho area. Since a large response from that area was not anticipated, a separate code was not used for St. Maries, alone.

The management team (consisting of Staff Officers, Rangers, and the Forest Supervisor) evaluated the comments and identified issues. Then they ranked each, individually, according to the seriousness and the difficulty of resolving the issue. Next, the managers considered what type of effort would be needed to resolve the issue, such as, political, economical, technical, social, or legal. They also considered how the issue would be resolved, by whom, and when.

Twenty issues were identified by the management team. As a result of this evaluation, emphasis shifted in the original fifteen issues. Three original issues were retained verbatim; six were dropped but are still addressed in this EIS and Forest Plan. One issue (energy consumption) was dropped entirely because no comments were received about it, and since it is being practiced daily, the management team didn't think it needed to be emphasized. Some issues were combined with other issues and one issue, timber, was split into four issues.

The strong topics of 1979 remained strong in 1985; these are timber production, wilderness, roadless areas, elk, fish, and roads.

Some topics received more emphasis than in 1979, a good example of this is local community stability. The announcement of the local mill closures during the public review period generated a considerable amount of interest in the Forest Plan. Many expressed the opinion that the Forest Service has a long-standing obligation to maintain local economic stability.

Some of the topics were generated after the public had a chance to review the documents, examples of these are: "watershed standards are too high or too low," or "funding may not be available to achieve the plan objectives" or "a 'worse case analysis' was not conducted."

Further information about each issue is in Section III of this appendix.

II. CONSULTATION WITH OTHERS

Clearwater National Forest personnel have coordinated with Indian Tribes, Federal, State, and local agencies, and other public organizations about the Forest Plan. Contacts were made through correspondence, phone calls, personal or group meetings, or a combinations of all these methods. Most meetings listed were meetings held specifically between the group and the Clearwater employees.

A. NATIVE AMERICAN TRIBES

-Coeur d' Alene: A meeting was held on November 15, 1979 to introduce the forest planning process to the Tribal planner. Even though the Tribe has been sent all mailings about the Clearwater, they did not comment on the draft documents. Another meeting was held in November 1986.

-Columbia River Inter-Tribal Fish Commission: Contacts between the Commission and Clearwater culminated with a two-day meeting in April 1986 to exchange ideas about anadromous fish and water quality.

-Nez Perce: Initial contact was January 10, 1979 through a meeting with the Nez Perce Tribal Executive Committee. Five other meetings were held in October 1981, October 1982, January 1985, and March and April 1986.

B. FEDERAL AGENCIES

-Advisory Council of Historic Preservation: Contact has been through correspondence and phone calls concerning cultural resource management.

-Bonneville Power Administration: Besides correspondence and phone calls, meetings were held to discuss transmission corridors in November 1985 and 1986.

-Bureau of Land Management: Contact has been through correspondence regarding their land management planning.

-Environmental Protection Agency: Contact has been through correspondence.

-National Historical Park: Besides correspondence and phone calls, the Clearwater has met annually with the Park service to discuss managing historical trails.

-U.S. Fish and Wildlife Service: Besides correspondence and phone calls, meetings were held about elk and fisheries habitat and threatened and endangered species in July and November 1985.

C. STATE AGENCIES

-Idaho Department of Health and Welfare (Division of Environment): Contacts have been made by correspondence or telephone. H & W personnel attended meetings in 1980 and 1985 where Forest planning information was presented.

-Idaho Department of Lands: Personnel from Idaho Department of Lands have attended meetings where information about Forest planning was presented. The latest meeting was in April 1985.

-Idaho Department of Park and Recreation: A meeting about managing the land for recreation was held with the Clearwater recreation specialist.

-Idaho Department of Transportation: Besides correspondence, a meeting to discuss the planning process and Highway 12 was held in April 1980.

-Idaho Fish and Game Department: Tom Legee, employee of Idaho Fish & Game, was hired as a cooperating employee between the three North Idaho Forests in 1980 and 1981. Besides annual meetings between the two agencies, meetings were held in April 1980, September 1982, March 1984, January, March, June, July, October and December of 1985 and January, March, and October of 1986.

-Idaho Governor's Office: The Forest Supervisor made a formal presentation to the Governor's Office in August 1982 and January 1985. Other employees met three times in 1985 and 1986 with the North Idaho Governor's Representative and in January 1986 with the Resource Coordinator.

-Idaho Natural Areas Coordinating Committee: Two meetings were held in 1981 to discuss the location and size of RNA's. Recent meetings were held in November 1985 and August 1986.

-Natural Resources and Economic Affairs Subcabinets, State of Idaho: Presentation of the preliminary findings of planning of the three North Idaho Forests was made in August 1982.

-State Historic Preservation Office: Contact has been via phone conversations and correspondence.

-Idaho Governor's Lewis and Clark Trail Committee: Meetings were held in October 1985 and September 1986.

D. ELECTED OFFICIALS

-U.S. Senator McClure: Senator McClure's representative has attended meetings where information about the Forest Plan was presented. Special meetings were held in November 1984 and January and September of 1986. The Forest Supervisor testified at a public hearing conducted by Senator McClure in August 1986.

-U.S. Senator Symms: Besides attending meetings where information about the Forest Plan was presented, Senator Symms representatives met with Forest personnel in December 1985, and January and November 1986. The Forest Supervisor testified at a public hearing in August 1986 of which Senator Symms helped conduct.

-U.S. Representative Craig: Besides attending meetings where information about the Forest Plan was presented, other meetings were held in December 1984, December 1985, and November 1986 with Congressman Craig's representatives.

-Idaho State Senator Marguerite McLaughlin: Besides attending meetings where information about the Forest Plan was presented and correspondence and phone calls, Senator McLaughlin has met once in 1985 and twice in 1986 with the Forest Supervisor concerning Forest planning.

-Idaho State Representative Carl Braun: Attended a meeting in December 1985.

-Idaho State Representative Harold Reid: Attended a meeting in December 1985.

-Clearwater County Commissioners: Besides correspondence and phone calls, meetings were held in September and December of 1985 and in October 1986.

-Latah County Commissioners: Besides correspondence, a meeting was held in July 1985 to discuss Forest planning and land exchange.

-City of Orofino Mayor: Mayor of Orofino made a presentation at a meeting in October 1986 about the Forest's responsibility to the community.

E. EDUCATIONAL INSTITUTIONS

-University of Idaho: Clearwater Forest personnel made presentations to a land management class and to a law class. Three meetings between the Clearwater and University officials were held in 1985 and 1986.

-Washington State University: Clearwater employees have made presentations about the Forest Plan to three different classes (land management planning, range management, and wildlife management).

-Eastern Washington University: Meeting was held in November 1986 with a representative of the Core Council.

-Idaho School Districts 171, 284, and 285: School representatives made presentations at a meeting in October 1986 about the impacts of Forest planning.

-Orofino High School: The Forest Supervisor made a presentation to the Senior class.

-Orofino Junior High School: The Planning Staff Officer made a presentation to an English seventh grade class.

F. BUSINESS AND INDUSTRY

-Timber Industries: Various meetings were conducted with the timber industry. Rather than list each business at each meeting, a list of the companies represented and a list of the dates of the meetings follows:

COMPANIES

Potlatch Corporation	Diamond International/ DAW
Gem State Lumber Co.	Bennett Lumber Company
Konkolville Lumber Co.	Coon Logging Inc.
Wickes Forest Ind.	Medley Logging Co.
H & W Logging	Keck Logging Co.
Plum Creek Lumber Co.	L.D. McFarland Co.
Henderson/Waldo Logging	Vinson Timber Products
Scott Paper Company	Champion International
Musselman Construction	Kelly Kelso Logging Co.
L.W. Hartig Logging Inc.	Triplett Logging
Finke Logging	McLaughlin Logging
Barnett Logging	Columbia Helicopters

MEETING DATES

June 1984	April 1986
July 1985	May 1986
August 1985	June 1986
December 1985	October 1986

-UNC Teton Exploration Drilling: Besides correspondence, a meeting was held during the early years of planning.

G. ORGANIZATIONS

-Associated Logging Contractors: A meeting was held in January 1986.

-Beta Sigma Phi Sorority: A meeting was held in April 1986.

-Chamber of Commerce: The Clearwater was invited to present information about the Forest Plan to the Lewiston group on March 1985 and March 1986. Information was presented to the Orofino group in July 1985 and June 1986. The Forest Supervisor served on a panel in November 1985 at the North Idaho Chamber of Commerce at Kamiah.

-Idaho Wildlife Federation: Two meetings were held in August 1984 and March 1986 where IWF members voiced concern over management of the Clearwater.

-Clearwater Good Sams Club: A meeting was held in April 1985.

-Idaho Conservation League: ICL members met with Forest personnel in August 1984, five times in 1985 (twice in January, once in Feb., Sept, and Dec.) and once in November 1986.

-Idaho Environmental Council: A meeting was held in December 1985.

- Idaho Natural Resource Legal Foundation: A meeting was held in Boise in January 1986.
- Idaho Sportsman Coalition: A meeting was held in November of 1986.
- Inland Empire Big Game Council: A meeting was held in April 1985 and April 1986.
- Inland Empire Fly Fishers: A meeting was held in November 1986 with this group and the Spokane Fly Fishers and Federal Fly Fishers.
- Inland Forest Resource Council: Meetings were held in May, October, and December 1985 and April 1986.
- Lewiston Wildlife Club: Meeting was held in November 1986.
- Orofino Interested Citizens: A meeting was held in July 1985.
- Outfitters and Guides: Meetings were held in March and June of 1985 and March 1986.
- National Wildlife Federation: Besides correspondence, a meeting was held in April 1986.
- Seirra Club: Meetings were held in August 1984, January, February, and December 1985, and October 1986.
- Spokane Resident Physicians: Meetings were held in January and April 1985 and April and November 1986.
- St. Joe Valley Association: Meetings were held in July 1985 and February 1986.
- Trout Unlimited: A meeting was held in November 1986.
- Wilderness Society: Meetings were held in June and August 1985 and January and November 1986.
- Women in Timber: Meetings were held with the Orofino group in January, June, and August 1986, with the Pierce group in February 1985 and April 1986 and with the Lewiston group in January 1985.

III. REVIEW OF OTHER AGENCIES' PLANS

AGENCY	PLAN	RELATED RESOURCES
U.S. Army Corps of Engineers	Dworshak FEIS, 1975.	The reservoir extends into National Forest land. This area has been designated by the Corps to be left as forest reserve or developed as recreational sites. There is a possibility that Dworshak could be designated as a National Recreation Area.

AGENCY	PLAN	RELATED RESOURCES
		<p>The demand for recreation could affect the Forest's options to manage land adjacent to the Corps.</p> <p>Road building to provide recreational facilities is a concern.</p> <p>The Corps' management could affect the Forest's fishery population by releasing water for extra electricity. The water velocities could flush fish eggs and young fish downstream.</p>
USDI, National Park Service	Lewis and Clark Trail National Historic Trail Comprehensive Plan for Management and Use.	<p>Recommends campsites and interpretive signs between Lee Creek Campground and the western boundary of the Clearwater.</p> <p>Coordinating with State of Idaho for the portion of trail on state land.</p> <p>Recommends interpretive signs at various locations.</p>
Clearwater Economic Development Association, Inc.	4 plans 1975, '77, '78, '80	Recognizes the role that natural resources play in the lifestyle of the five county area.
Lewis County	Lewis County Comprehensive Plan.	Identifies human and natural resources in Lewis County.
Latah County	Latah County Comprehensive Plan.	Identifies human and natural resources in Latah County.
Asotin County	Asotin County Comprehensive Plan.	Identifies human and natural resources in Asotin County.
Clearwater County	Clearwater County, Idaho Economic Development Plan, 1980.	Identifies human and natural resources in Clearwater County.
Benewah County	The Economic Structures of Benewah County, Idaho 1979.	Identifies human and natural resources in Benewah County.
Montana Department of Natural Resources and Conservation	Montana Preliminary Forest Resources Plan, 1980.	Level of timber harvest needed from Federal lands to meet Montana's needs.

AGENCY	PLAN	RELATED RESOURCES
		Management of water, fish and wildlife, range and wildfire.
		Inventory of timber to include assessment of resource supply and demand.
Panhandle Area Council	Annual Economic Development Plan for North Idaho, 1981.	Identifies the strengths and weaknesses of northern Idaho.
USDE, Bonneville Power Administration	Proposed Fiscal Year 1981 Program, October 1980.	Proposes herbicide use to maintain vegetation around equipment. No applications planned in Clearwater National Forest.
Idaho Department of Fish and Game	Species Management Plans, 1981-85.	Sets harvest goals, population levels, and hunter days for all big-game species.
		Describes management philosophy, direction, and priority. Documents associated resource problems and programs for their resolution.
U.S. Fish and Wildlife Service	Wolf Recovery Plan	Charts direction for the recovery of the endangered gray wolf in the Pacific Northwest.
		Gives general future direction for responsible agencies.
USDI, Bureau of Land Management	Attitudes and Perceptions of BLM Resource Management Activities in the Coeur d'Alene District, 1979.	Indicates public attitudes toward natural resource management in eleven northern counties.
USDI	Social Economic Profile Clearwater BLM Region 1976.	Indicates public attitudes toward natural resource management.
	North Idaho Timber Management DEIS, 1980.	Looks at all natural resources managed on BLM lands in northern Idaho. Some of these lands are close to the Forest's boundaries.
		Proposes road locations and timber harvest and resource changes resulting from timber harvest.

IV. SELECTED ISSUES, CONCERNS, AND OPPORTUNITIES

A. MAJOR ISSUES ADDRESSED IN THE EIS

Following is a discussion of the original 1979 major issues, concerns, and opportunities and how the public viewed them in 1985. Major issues identified in 1985 are discussed within the issue identified in 1979. Only one 1985 major issue did not fit in any category and that one has been added to the end of this Section. Also discussed is how the Forest responded to each.

At the end of this section is a list of the major issues of 1979 and a list of the 1985 issues. In Chapter III of the EIS is a more complete description of each resource.

ICO 1 - RECREATION

How will the Forest respond to the increased demand for dispersed and developed recreation?

This issue was identified as a major issue in 1979 and visual resource management, which was, then, a part of the recreation issue, has been identified as a major issue in 1985.

The public comments about recreation in 1979 and 1985 were similar except that energy conservation concerning recreational activities was not mentioned in 1985.

Tied close to the recreation issue is the roadless and wilderness issue. Many of the comments in 1985 were concerned about recreating in the unroaded areas. Some were opposed to "locking-up" the land to only a few recreationists, while others were concerned about exploiting areas that are currently natural. Mentioned in 1985 was the availability of all the Forest to handicapped persons. Those favoring developing the land thought that if unroaded areas were not developed, local residents, who account for most of the recreational use in the Forest, would lose their jobs and leave the area. Others thought the Forest failed to capitalize on recreation as an economy benefit to the local communities.

Resolution of this issue has involved determining the need for additional developed recreational facilities and then identifying areas suitable for this use. It has also involved identifying areas suitable for dispersed recreation where few facilities are provided. A proper mix of opportunities for recreation has been examined and evaluated based upon existing and projected demand. Also, potential conflicts between individual recreational uses and between recreation and other Forest uses, such as transitory range, protection of wildlife habitat, and timber harvest, have been reviewed.

Based on projected population growth, developed recreation is expected to increase. A new campground at the mouth of Isabelle Creek in the North Fork District and a new VIS center in the Lochsa District are planned for the first decade in all alternatives except Alternative B. Dispersed recreation is also expected to increase or stay as current.

Recreation visitor days (RVD's) are estimated for developed, semiprimitive, roaded natural, wilderness, dispersed, hunting and fishing recreation in each alternative. The different levels of RVD's are a result of the objective of each alternative.

VISUAL RESOURCE MANAGEMENT

Although not addressed separately in 1979, visual resource management became an major issue in 1985.

Respondents expressed concern that visual objectives restrict timber harvest and road building. They also thought that the DEIS did not adequately address the impact from visual objectives.

The Forest responded to this issue in the Preferred Alternative by reducing the projected amount of even-aged timber management in the foreground viewing areas, and adding more restrictive standards and guidelines on the design and shape of clearcuts. The visual quality objectives have been mapped.

ICO 2 - CULTURAL RESOURCES

What type of management will be provided for archeological and historical resources?

This issue remained a major issue from 1979, although in 1985 most of the comments were about protection of the historic trail systems. This interest centers around the historical trail corridor used at different periods by the Nez Perce Indians, the Lewis and Clark Expedition, miners, trappers and others traversing the Bitterroots. This trail, the Lolo Trail system which includes the Nee Me Poo and Lewis Clark Trails, is on the National Register of Historic Places and is a National Historic Landmark.

Bonneville Power Administration expressed concern that protection of the corridor was too restrictive and that it could conflict with a potential energy transmission corridor.

All of the other comments about cultural resources expressed doubts that the Clearwater's program would protect the resource. Many of the respondents prefer cultural resources protection regardless of the affect on other resources. Conflicts arise when protection of cultural resources prevents timber from being harvested and roads from being built.

In the Preferred Alternative, the A6 Management Area direction has been strengthened to emphasize interpretation of historical resources for the appreciation and understanding of Forest users. The Lolo Trail Implementation Guidelines, which supplements direction in the Forest Plan, has been revised to better address the comments, and the portion of the trail which contains the only undeveloped section of the Lewis and Clark Trail in the Nation has been protected from development.

ICO 3 - SPECIAL AREAS

What additional areas will be identified for research and special interest (research natural

areas, and scenic, botanic or geological attractions)?

This remained a major issue in 1985. The Forest only received a small percentage of public comments about special areas, but this issue has existed long before Forest planning began and needs to be resolved.

In 1977 the Clearwater Forest identified and set aside a 1,281 acre research natural area (RNA) along the Lochsa River. Since that time, special scenic, botanic, and geological areas have been studied. These areas are usually not compatible with timber harvest, mineral exploration, wildlife habitat management, or road building, but can enhance watershed and visuals. Most of these areas are attractions of special interest and would be managed for public use while research natural areas (RNA's) are established primarily for long-term research, and public use is generally not encouraged.

The proposed 900 acre-Aquarius RNA in the Proposed Plan was criticized as being too small to protect the unique features of the area. Twelve other areas were suggested for potential special interest sites.

Each alternative proposes different acreages to be managed as RNA's. In the Preferred Alternative, Aquarius RNA has been increased to 3,900 acres, and Four-Bit Creek area has been proposed as an RNA. Twelve other areas of approximately 500 acres have been designated as special areas.

ICO 4 - WILDERNESS

What lands will be considered for wilderness classification, and how will existing classified wilderness be managed?

Of all the issues, the issue of wilderness classification and the timber issue have remained the two which receive the most attention from the public. Along with the timber issue, this issue received more comments than all other comments combined. It was sharply divided between those favoring more wilderness or roadless designations, and those favoring less.

The second aspect of this issue, managing the existing Selway-Bitterroot Wilderness, was a management concern in 1979, but was not a major issue in 1985.

Sixty-six percent or 950,311 acres of the Clearwater is inventoried as roadless. Of these, the Mallard-Larkins and Hoodoo (Kelly Creek) areas received the most support for wilderness. Both of these areas were mentioned because of their wilderness values. Other areas such as Toboggan, Cayuse, Fish, Hungery and Weitas Creeks were mentioned for roadless or wilderness status to protect the fish and wildlife.

The popular reasons for leaving an area undeveloped were:

- for preservation for future generations,
- for solitude and hiking opportunities,
- for high water quality and fish habitat,
- for wildlife habitat and quality hunting opportunities,
- for outfitter and guide businesses, and
- for scenic beauty.

The popular reasons for developing roadless areas were:

- for timber harvest and road construction which means jobs,
- for community stability and lifestyles,
- for increase taxes to the State and counties,
- for allowing everyone, including the handicapped, to see the beauty of the area, and
- for allowing Idahoans the chance to decide the future of the State, not someone back East who rarely visits Idaho.

The Preferred Alternative recommends wilderness in the Mallard-Larkins and Hoodoo areas. It also recommends an additional 18,500 acres to the existing Selway-Bitterroot Wilderness.

ICO 5 - ROADLESS AREAS

Will any areas be managed as roadless?

As stated in the wilderness issue, this has remained an important issue. In 1985 the wilderness issue and roadless issue are combined.

Specific concern was expressed for carefully managing roadless lands for recreation. Those in favor of roadless areas want to preserve the area for elk, fish, recreation, and scenery. Some recognize the need for timber harvest in some areas, but only in the future when better technology will be available. Many of those favoring less roadless area mentioned the lack of road prevents them from recreating in certain areas and prevents fire and disease control. Many stated that roadless areas do not allow multiple use management, but others questioned whether it might be more cost effective to leave an area unroaded than developing it for timber.

The majority of the comments which mentioned a specific area were about Kelly Creek; all opposed developments. Other areas mentioned were White Sands, Minnesaka, Mallard-Larkins, Cayuse Creek, Great Burn, Pot Mountain, North Lochsa Slope, Weir-Post Office, Lochsa Face, Eldorado Creek, Tobaggan, Meadow Creek and Fish-Hungery Creek area.

The variation between alternatives is made up largely by how the 950,311 acres of roadless lands are designated. A wide range of management activities have been proposed in the alternatives from developing the areas to retaining them in a unroaded condition. Proposed uses of roadless areas allow for improved management of wildlife and fish habitats, fuel management, mineral exploration, and watersheds. Roadless area management precludes timber harvest and road building.

In the Preferred Alternative Tobaggan, Hungery, Monroe, Fourth of July Creeks, Paradise Meadows, and Elk Summit are designated unroaded in response to public comments.

ICO 6 - FISH AND WILDLIFE

How will the Forest manage wildlife habitat (summer and winter range) and fisheries habitat?

This issue has remained a strong issue throughout the planning process. In the 1985 issues, fisheries and water quality are considered together.

Winter range is the major limiting factor on elk populations in the Clearwater as summer range is more than adequate. Winter range capacities for elk have been decreasing over the last 20-30 years as the Forest vegetative cover has grown older and the brush fields, which resulted from the massive wildfires in the early 1900's, have begun to convert to trees. Currently the Forest can support between 13,500 to 17,000 elk in the winter, depending on the severity of the weather.

This issue received many comments in 1979 and 1985. Concerning the draft documents, most comments about winter range questioned the Forest's ability to accomplish ten times more acres of burning on winter range each year than it had in the past. The respondents also questioned rather the Forest would have the budget to accomplish such a high standard. While many people acknowledged the importance of properly managed winter range for elk, there appeared to be more concern with summer range management, especially in connection with road closures. Although most respondents thought more roads in summer range should be closed, there were others who objected to road closures because they think it limits their opportunity to enjoy the Forest.

Although a few respondents asked that no special consideration be given to the threatened and endangered species, most concerns were for the protection and enhancement of habitat for threatened and endangered species. On the Clearwater that includes the gray wolf, grizzly bear, and bald eagle. Generally, any type of development would conflict with management of these animals' and birds' habitats.

The Clearwater currently provides relatively high water quality in most of the Forest, excellent resident fish habitat, and an anadromous fish habitat capable of supporting more fish than it does. Some respondents expressed concern that the water quality standards were too high, but others thought that the fish standards were too low. Others questioned the reliability of our data and computer models used to estimate impacts on water quality and fish habitat.

Native Americans Tribes emphasized that water quality and anadromous fisheries are the most important resources provided by the Forest.

Resolution of this issue involves the protection and enhancement of habitats for various fish and wildlife species. Also involved is the evaluation of the relationship of fish and wildlife and their habitats to other resource uses and demands. Because the Forest Service manages habitat and the Idaho Department of Fish and Game has responsibility for managing populations, cooperation and coordination between the two agencies are essential.

Each alternative offers different level of prescribed burning to enhance big game habitat. The amount of fish habitat improvements also varies by alternative.

The Preferred Alternative designates winter range to management direction that combines timber harvest with seasonal road closures and prescribed burning on only half of the acres proposed in the draft documents. The summer range will be managed by leaving 683,000 acres unroaded and by closing roads to protect other summer ranges.

The water quality standards will meet or exceed the State and Federal water quality standards. The fish standards were not changed but different standards were applied to some of the streams in the Forest.

ICO 7 - RANGE How much and which lands will be available for domestic livestock grazing?

This issue received seven comments during the review period of the draft documents; it is not a major concern for users of the Clearwater Forest. The seven comments were equally divided for and against designating land for livestock grazing.

About 16,000 acres or less than one percent of the Forest has been identified as primary range land. Several cattle and horse grazing allotments already exist. Some conflicts have occurred between domestic livestock and other resources, primarily wildlife, fish, water, and recreationists. These conflicts occur in riparian areas where livestock overgraze, thus creating more sediment in the streams and displacing wildlife.

ICO 8 - TIMBER PRODUCTION To what extent can the Forest meet the demand for a continued supply of timber?

In both 1979 and 1985 this issue, which has many sub-topics, has received more comments than any other issue, although in 1985, several aspects of this issue gained more attention and became major issues. These are community stability, suitable timberland, silvicultural systems and below-cost sales.

The timber supply issue received more comments than any other single issue; in fact, comments which stated that the proposed timber harvest was too low were the most numerous. These comments came from the St. Joe Valley Association form in St. Maries and from the Orofino Crisis Rally form. (See Section 1 of this appendix.)

The timber industry contends that more timber is needed from National Forest lands, because timber on their lands has been harvested. Local community leaders are extremely concerned that local jobs and the local economy will be adversely affected by a shortage of timber. Most comments from individuals on economics revolved around the concept that there are too many restrictions placed on the logger causing the cost and operations to be uneconomical.

The Forest Service completed A Report on Idaho's Timber Supply in February of 1987. The report concluded that timber supply in northern Idaho was adequate to sustain past harvest levels. The report did not consider projections of demand; however, a further breakdown of the supply-demand situation specific to the three North Idaho Forests was done by the Regional Office. For the Clearwater it showed that the demand was most likely to exceed assumed local supply starting about 1995 which is near the end of this planning period.

The local timber industry also assessed current mill capacity relative to potential timber supply in the Clearwater - Nez Perce National Forest areas.

This document showed that current annual mill capacity was 52 MMBF more than the anticipated supply for the plan period.

When considering suitable timberland, respondents felt that more of the Clearwater should be considered unsuitable for timber to meet the land management planning regulations because of the five year reforestation requirements, potential water and soil problems, and economics considerations.

Other respondents were concerned that only 54 percent of the Forest was considered suitable for timber management in the Proposed Plan. Some respondents said that a map of unsuitable lands was needed to comply with NFMA.

Respondents also expressed concerns over the large amount of clearcutting prescribed and its affects on other resources. They said that the Forest should have analyzed an alternative that included only uneven-aged management. Respondents also suggested that trees are not being planted at a rate which keeps up with harvest levels. Many expressed concern about vast areas which remain unplanted, and voiced doubts about sustaining strong timber harvest levels in the future.

Another topic mentioned repeatedly was the waste of "harvestable" timber, and though not mentioned specifically, it is assumed that many were speaking of land taken out of timber production because of special designations.

Each alternative considers a different level of timber harvest. In the Preferred Alternative the allowable sale quantity (ASQ) has been raised to 173 MMBF which is an increase over the 165 MMBF offered in the last ten years. Both even-aged and uneven-aged silvicultural systems will be used but it is assumed that the use of even-aged systems will predominate in most of the Forest.

ICO 9 - WATER

What measures will be taken to protect watershed and maintain high quality water?

Even though water quality has remained a strong issue during the planning process, it received relatively few comments. In the 1985 issues, fisheries is tied to water quality rather than to wildlife.

The Clearwater Forest covers two major river drainages which produce an abundance of high quality water. Most uses within the Forest affect water quality either directly or indirectly. Of particular concern are land disturbing activities like timber harvesting, road building, and mining.

Water quality standards gained much attention in 1985 because the timber industry considered them to be much higher than the State's standards and thus a significant constraint on logging operations. From the other point of view, respondents were concerned that the standards were not strict enough to alleviate possible irreversible damage to soil, water, fisheries, and riparian resources. Both sides were skeptical about the ability of the Forest's computer models to adequately predict natural responses. There were also concerns that potential funding and monitoring would be inadequate to protect water quality and fisheries.

All alternatives show different levels of sediment. In the Preferred Alternative the Forest changed the methodology that predicts sediment by allowing the FORPLAN model to predict potential sediment from timber and road building. The Forest didn't drop the high water standards, but it did change the riparian prescription and monitoring requirements.

ICO 10 - MINERALS

How will the Forest consider minerals and mining opportunities while providing for adequate protection of other resources?

This is not a major issue in 1985, although the Forest did receive some comments about minerals. The potential of minerals becoming a very important issue exists if significant minerals are found in the Forest.

The Forest Service policy is to integrate the development and use of minerals with the use and conservation of other resources to the fullest extent possible under the existing mineral laws. Some segments of the public have expressed concern about increasing mineral activity because of potential air, water, and soil degradation. Yet, some are becoming increasingly concerned about the amount of land being withdrawn from mineral entry or managed as to effectively shut down mineral activity.

Mineral activities and access under the present mining laws would be constrained in varying amounts depending on the land designation. For example, a land designation for primitive back-country recreation in a particular area would restrict the location and kind of access allowed for mineral development within that area. In a designated wilderness, only valid mining claims and mineral leases in effect at the time of designation or as stated in designation legislation could be developed. All other wilderness lands would be withdrawn from mineral entry. Other conflicts include the amount of sediment produced which could effect fish, disturb wildlife habitat, disrupt the scenery, and interfere with recreation.

The available land area for mineral entry changes by alternative. No further mineral entry is allowed in the Selway-Bitterroot Wilderness.

ICO 11 - ENERGY

What opportunities does the Forest have to aid in the conservation of energy?

Although this was an issue in 1979, no comments were received on the DEIS and Proposed Forest Plan about energy consumption. It was dropped as an issue.

ICO 12 - LANDOWNERSHIP

What direction should the Forest take regarding land ownership adjustment?

Although there were a few public comments about landownership adjustment, this issue was dropped from the major issues in 1985. It is still addressed in this EIS and accompanying Forest Plan.

In some areas of the Forest, private entities own alternating sections of land, creating a "checkerboard" ownership pattern. Adjustment of these patterns by "blocking up" ownership could increase land management effectiveness of both private landowners and the Forest Service.

Attention has been given to this issue at both the Regional and Forest level.

ICO 13 - ROADS

What road system should be developed and how should it be managed?

This has remained a major issue. Reviewers of the Proposed Plan expressed concerns that the Forest was planning to build too many roads to a higher standard and cost than necessary. Also reviewers expressed concern that roads and their construction have significant adverse affects on soil, water, wildlife, recreation and visual quality. Two specific roads were mentioned repeatedly; one was for closure of the Fly Hill Road and the other was opposition to an extension of Indian Henry Ridge Road. The issue of road management is addressed in the wildlife summer range issue.

The Forest's road system is closely related to and directly affects other resources uses. For example, roads are necessary for timber production, some types of recreation and other uses, but roads and road construction can have a detrimental effect upon other values like water quality, wildlife and primitive recreation.

Road miles vary in each alternative. In the Preferred Alternative, the Forest will build as few as road as possible at the lowest standard possible to meet the objective. Aerial harvest will be practiced when feasible.

ICO 14 - U.S. HIGHWAY 12

How will the Forest manage U.S. Highway 12 and the Wild and Scenic River Corridor?

This did not remain a major issue in 1985 but potential candidates for Wild and Scenic River status become one when several respondents pointed out that the Forest had not complied with its own requirements to review and identify potential candidates.

Three streams are eligible for study for inclusion into the National Wild and Scenic Rivers System. They are the North Fork of the Clearwater River, Kelly Creek, and Cayuse Creek. Separate studies will be needed to determine whether these streams are suitable for inclusion in the system. Until studies can be completed, the streams will be protected from adverse impacts.

ICO 15 - FIRE MANAGEMENT

In what areas will fire suppression practices be modified to allow some fires to burn?

This did not remain a major issue in 1985; nevertheless, the EIS and Forest Plan address fire management.

Although there were not many comments about fire in 1985, many respondents used

fire as a reason to harvest timber because timber left standing would create fuel for fire.

NEW ISSUE - ENERGY TRANSMISSION CORRIDOR

Only one topic, energy transmission corridors, became a major issue in 1985 that had not been identified in 1979. Bonneville Power Administration (BPA) expressed concern that protection of the Lolo Trail corridor was too restrictive that it could conflict with a potential energy transmission corridor.

BPA major energy corridor "window" is identified across the Forest from the vicinity of Pierce-Weippe to Lolo Pass. No development of this corridor is planned during this planning period, but corridor development might be possible after serious study and mitigation.

B. 1985 ISSUES

Following are the 1985 major issues:

1. Visual Resource: How should the Forest manage visual resource objectives when these objectives may restrict timber harvesting?
2. Cultural Resource: What type of management will be provided for archeological and historical resources, especially the historic Lolo Trail corridor?
3. Special Areas: What additional areas will be identified as Research Natural Areas or special or unique?
4. Wilderness and Roadless: Which lands should be considered for wilderness classification and which should be designated to unroaded management?
5. Wild and Scenic Rivers: Which streams should be considered as candidates for Wild and Scenic River status?
- 6 and 7. Wildlife: How will the Forest manage wildlife habitat on winter range? How will key summer range be managed after timber is harvested?
- 8, 9, 10, and 11. Timber Production: To what extent can the Forest meet the demand for a continued supply of timber to support local community stability? How will the Forest evaluate unsuitable and suitable timberlands? How will the Forest decide which silvicultural system to use? Should timber sale receipts cover the cost of harvesting timber?
12. Water and Fish: What standards should be followed to ensure high water quality and fish habitat?
13. Riparian Areas: How will the Forest manage timber in riparian areas?
14. Road Construction: How will the Forest evaluate road construction, design standards, and projected road costs? How will the Forest manage roads?

15. Energy Transmission Corridor: How will the Forest comply with the Bonneville Power's request to consider an energy transmission corridor window across the Clearwater Forest?

C. 1979 ISSUES

Following are the 1979 major issues:

1. Recreation: How will the Forest respond to the increased demand for dispersed and developed recreation?
2. Cultural Resource: What type of management will be provided for archeological and historical resources?
3. Special Areas: What additional areas, besides the 1,281-acres Lochsa Research Natural Area, will be identified as special or unique (Research Natural Areas, scenic, botanic, or geological area)?
4. Wilderness: What lands will be considered for wilderness classification and how will existing classified wilderness be managed?
5. Roadless Areas: Will any areas be managed as roadless?
6. Fish and Wildlife: How will the Forest manage wildlife habitat and fisheries habitat?
7. Range: How much and which lands will be available for domestic livestock grazing?
8. Timber Production: To what extent can the Forest meet the demand for a continued supply of timber?
9. Water: What measures will be taken to protect watersheds and maintain high quality water?
10. Minerals: How will the Forest consider minerals and mining opportunities while providing for adequate protection of other resources?
11. Energy: What opportunities does the Forest have to aid in the conservation of energy?
12. Land Ownership: What direction should the Forest take regarding landownership adjustment?
13. Roads: What road system should be developed and how should it be managed?
14. U.S. Highway 12: How will the Forest manage U.S. Highway 12 and the Wild and Scenic River Corridor?
15. Fire Management: In what areas will fire suppression practices be modified to allow some fires to burn?



Appendix B

Description of the Analysis Process

I. INTRODUCTION

A. PLANNING OPPORTUNITIES

The Forest Service is responsible for determining the best way to manage National Forest lands based on public desires and land capabilities. The Clearwater National Forest is located in north central Idaho and contains 1,837,116 acres of diverse land forms and vegetation. The wide variety of seral and climax-type vegetative communities that exist support a rich and varied wildlife community. The wood products industries are important to the local economy with 26 percent of the private sector's income resulting from Forest related outputs. In addition, the Forest provides an attractive setting for recreationists who spend money for supplies and services.

Public interest includes divergent viewpoints about the use of commodities, such as timber, grazing, and minerals and about the use of noncommodities, such as wilderness, unroaded recreation, scenery, wildlife, old growth, and diversity. The Forest's major planning goal is to provide enough information to help decision makers determine which combination of goods, services, and land designations will maximize net public benefit. (See Section IV for more discussion of Net Public Benefit.) The National Forest Management Act (NFMA) and the regulations developed under NFMA (36 CFR 219) provide the analytical framework to address this objective, and also state that the requirements of the National Environmental Policy Act (NEPA) and its regulations (40 CFR 1500-1508) must be applied in this analysis process.

B. PLANNING PROCESS

The planning and environmental analysis process brings a new outlook and a new technology to National Forest land management. Principally these changes are: (1) processes formerly used to make individual resource decisions are now combined to help make integrated management decisions, and (2) new mathematical modeling techniques are used to assist in the land designation problem including identifying the most cost-efficient pattern of land management.

The 10-step planning process is discussed in the NFMA regulations and in Chapter I of this EIS on page I-*. This Appendix describes the analysis phase of this process including steps 3, 4, 5 and 6. The judgment phase, steps 1, 2, 7 and 8, is described in Chapters I, II, and in Appendix A. The execution phase, steps 9 and 10, is presented in the Forest Plan.

1. Inventory Data and Collect Information (Planning Step 3)

The interdisciplinary team (ID team) determined which data were necessary based on the issues, concerns, and opportunities. The analysis of the management situation, formulation of alternatives and monitoring require data on resource capabilities, existing supply and demand, expected outputs, benefits and costs. Existing data were used whenever possible and were supplemented with new data to help resolve issues or management concerns. Data are on file in the Forest Supervisor's Office.

2. Analysis of the Management Situation (Planning Step 4)

This analysis examines resource supply and market conditions and determines suitability and feasibility for resolving issues. A land designation model (FORPLAN) was used to address a number of specific requirements, including benchmarks. Requirements include: (a) projecting the Forest's current management program; (b) determining the Forest's ability to produce a range of goods and services from minimum management to maximum production; (c) evaluating the feasibility of reaching the national production goals (RPA targets) and social demands identified as issues, concerns and opportunities; and (d) identifying monetary benchmarks which estimate the output mix which maximizes present net value (or minimizes the cost) of resources having an established market or assigned value and meeting other departure analysis requirements. The analysis of the management situation document is on file in the Forest Supervisor's Office.

3. Formulation of Alternatives (Planning Step 5)

The information gathered during the first four planning steps was combined and analyzed to formulate alternative management plans. The alternatives reflect a range of resource management directions. Each major public issue and management concern was addressed in one or more alternatives. Management prescriptions and practices were formulated to represent the most cost-efficient way of attaining the objectives for each alternative. Both priced and nonpriced outputs are considered in formulating the alternatives.

4. Estimation of Effects of Alternatives (Planning Step 6)

The physical, biological, economic and social effects of each alternative were estimated and analyzed to determine how each responds to the range of goals and objectives assigned by the RPA program. FORPLAN was used to estimate some of the economic and physical output effects while other methods were used for remaining effects. The analysis included: (a) direct effects; (b) indirect effects; (c) conflict with other Federal, State, local, and Indian Tribe land use plans; (d) other environmental effects; (e) natural or depletable resource requirements and conservation potential; (f) historic and cultural resources; and (g) means of mitigation.

II. INVENTORY DATA AND INFORMATION COLLECTION

A. FOREST DATA BASE

1. Capability Areas

The basic resource data storage unit is the capability area. Capability areas are lands delineated for the purpose of estimating their response to various management practices, resource values, output coefficients, and multi-resource or joint projection functions (FSM 1920.5). There are approximately 9,000 capability areas. Forest capability areas reflect the following criteria:

1. Proclaimed Forest
2. State
3. County
4. Ranger District
5. Administratively designated areas, e.g., Research Natural Areas
6. Legally designated areas, e.g., classified wilderness, recreation river corridor
7. Timber compartment boundaries (which relate to watershed boundaries)
8. Landtypes grouped into ecologic land units (includes habitat types)

The result of the delineation steps described above was overlaid with the photo-interpreted stands done in the 1973 timber inventory. This resulted in subdivisions of capability areas called "cells." Each cell was assigned a unique condition class.

2. Analysis Areas

Analysis areas are one or more capability area cells combined for the purpose of analysis in formulating alternatives and estimating various impacts and effects (FSM 1920.5). Capability area cells were stratified by existing timber or condition classes and then aggregated into analysis areas according to similarities in capability, timber types, and economic effects. There are 362 analysis areas.

3. Production Coefficients

Resource outputs were developed for each analysis area by linking resource suitability and economics to analysis areas. Analysis areas suitable for timber production were linked to timber photo interpretative maps which were linked to timber outputs. Forage production for elk was measured on elk summer and winter range. Recreational coefficients were tied to population trends and capacity. Local and collector road miles were estimated by prescription for each analysis area. Sediment coefficients were developed for management induced erosion above naturally occurring levels. Existing range was estimated for the current permanent and transitory range. Other resource data including costs, benefits, slope, geology, and riparian areas were utilized to further refine or constrain outputs.

Production coefficients used were expressed in the following units:

Timber	Thousand cubic feet/acre/decade
Dispersed recreation	Rec. visitor days/acre/decade
Winter elk numbers	Elk/acre/decade
Summer elk numbers	Elk/acre/decade
Livestock forage	Animal unit months/acre/decade
Road construction	Miles/thousand acres/decade
Sediment	Tons/acres/decade

4. Suitable Lands

a. Tentatively Suitable Lands

Forest personnel used resource data to determine acres tentatively suitable for management practices. All areas were considered suitable for some form of recreation and some type of wildlife use. Roadless area size and evidence of human activities were used to determine wilderness suitability. Forest habitat type, soils, timber type, and legal status were used to determine areas tentatively suitable for timber production. Elevation and aspect were used to determine areas tentatively suitable for elk winter range.

Table B-1. Identification of Tentatively Suitable Timberland

<u>Description</u>	<u>Acres</u>
1. Total net Forest area	1,837,116
2. Non-Forest lands (includes water)	(24,370)
3. Forest lands	1,812,746
4. Forest lands withdrawn from timber production	(276,894)
5. Forest lands not capable of producing crops of industrial wood	(147,781)
6. Forest lands physically unsuitable (not restockable within 5 years)	(51,997)
7. Tentatively suitable Forest lands	1,336,074

Nonforest land includes meadows, avalanche areas, rock outcrops, talus slopes, sod grasses, and ferns. These were defined by original landtypes 16Q20, G07, G08, Q08, G17R, T, 13A02, and M. Recently new landtypes have been developed with the corresponding landtypes defining nonforest land: 16U96, 31G45, 31S45, R, U30, U31, T, 11A47, 11A97.

Forest lands withdrawn from timber production includes the Selway-Bitterroot Wilderness (259,165 acres), the Lochsa Research Natural Area (1,281 acres), and the Mallard-Larkins Pioneer Area (16,448 acres).

Forest lands not capable of producing crops of industrial wood includes scoured cirque basins above 5000 to 8000 foot elevation with north and east aspects and scoured rolling uplands. Sites are severe with stony and droughty soils. Whitebark pine habitat types dominate. Not capable land is further defined as upper slopes and glacial trough walls that have resulted from freezing and thawing and glacial scouring. These occur at elevations from 4500 to 7500 feet with primarily north and east aspects and 40 to 70 percent rock outcrop. The habitat type is subalpine fir/beargrass. These were defined by original landtypes 38Q17, 36Q18, 34Q18, 34Q19, 41L05, 63Q16, 63Q17, 65Q18, 65Q21, and 65Q24. New landtypes are U96, 36U92, 33U76, 34U76, 41L91, 63U80, 61U96, 34U86, 48L80, 49L80.

Forest land physically unsuitable cannot be restocked within five years. This is defined as south and west facing breaklands and higher slopes within thin

and droughty soils, little or no ash cap, 35 to 70 percent gravels and cobble and 10 to 50 percent rock outcrop. Vegetative cover is thin and clumpy with Douglas-fir habitat types dominating. Soils are excessively well drained. These were defined by original landtypes 31G17, 31G18, 30T01, 61G17, 63G18, 61S75, 63S78, 61T01. New landtypes are 31U30, 31U31, 60U30, 60U31 61U30, and 61U31.

b. Timber Prescription Economic Analysis

The Forest planning regulations (36 CFR 219.14) require an analysis of timber resource land suitability. There are several stages to this analysis. The first stage (219.14 [a]) identified lands not suited for timber production. The results of this stage are presented in Section III, B. of this Appendix. For lands other than those that were identified as not suited, an assessment of the costs and benefits for a range of management intensities for timber production had to be made (219.14 [b]). This assessment, identified below, includes only the direct costs and benefits of timber production. The third stage (219.14 [c]) consists of identifying lands which are not appropriate for timber production to meet objectives of the individual alternatives being considered. The results of this analysis are summarized in Table II-23 of the Final EIS.

During the public review period of the Draft EIS, several comments were made citing the fact that the second stage of the timber resource land suitability analysis was not found in the documents. The following is an economic analysis of all the timber management prescriptions used in the FORPLAN model during the preparation of the Final EIS.

The first step was to identify the direct costs and benefits related to timber production for each prescription. Direct benefits are those which contribute to expected gross receipts to the government. Direct costs include anticipated investments, maintenance, operating, management, and planning costs attributable to timber production.

The next step was to calculate present net value of each timber intensity and each timing option. Present net value equals the excess, over the 150 year planning horizon, of discounted benefits less discounted costs. These timber management intensities which yield a positive PNV show direct benefits from timber production which exceed direct costs.

As a result of this analysis, we know which analysis areas yield positive returns for timber management and the timber management strategy and timing option which yields the highest PNV on each. The planning records contain detailed information on the results of this analysis for each analysis area.

The NFMA regulations (36 CFR 219.14 [b]) require the Forest to "...identify the management intensity for timber production for each category of lands which results in the largest excess of discounted benefits less discounted cost..." Table B-2 shows this summary by analysis area grouping on tentatively suitable lands.

In Table B-2, the analysis area groupings represents analysis areas with similar PNV's. The analysis area groupings are listed in order of decreasing

PNV. The PNV-per-acre-column represents a weighted average. This is derived by taking the per acre PNV of each analysis area in the group "times" the number of acres in the analysis area which have been summed together and divided by the total acres in the grouping.

The acres-available-column in the table does not represent a designation but rather the total acres that could receive the prescription. A given area has the choice of several prescriptions which is determined during the alternative development phase of the process.

Table B-2. Management Intensity Having Greatest PNV Per Acre
(Discounted Timber Benefits Minus Discounted Timber Costs)
By Analysis Area Groups

Roaded/ Roadless	Productivity Class	Slope	Age	Management Intensity	Acres Available	Weighted Average PNV Per Acre (\$)
-----Management Area A4 and A6 *-----						
Roaded	PROD 1	<55	>120	Uneven-aged	94,469	47.
Roaded	PROD 2	<55	> 40	Uneven-aged	23,682	-173.
Roadless	PROD 1-2	<55	> 40	Uneven-aged	212,384	-339.
Roaded	PROD 1	<55	<120	Uneven-aged	135,921	-370.
Roaded	PROD 2	<55	< 40	Uneven-aged	11,188	-425.
Roadless	PROD 1-2	<55	>120	Uneven-aged	11,901	-445.
-----Management Area C4-----						
Roaded	PROD 1-2-3	All	All Ages	Final Harvest	43,893	537.
Roadless	PROD 1-2-3	All	All Ages	Final Harvest	61,102	357.
Roaded/ Roadless	PROD 1-2-3	All	NS **	Final Harvest	10,336	-516.
-----Management Area C8S-----						
Roadless	PROD 1-2-3	<55	>40	Final Harvest	66,192	612.
Roadless	PROD 1	>55	>40	Final Harvest	29,905	299.
Roadless	PROD 1-2-3	<55	>40	Final Harvest	128,733	226.
Roadless	PROD 1-2-3	<55	<40	Final Harvest	8,429	113.
Roadless	PROD 2	>55	>40	Final Harvest	33,859	79.
Roadless	PROD 1-2-3	<55	All Ages	Final Harvest	90,689	42.
Roadless	PROD 1,	>55	<40	Final Harvest	4,062	36.
Roadless	PROD 1-2-3	<55	<40	Final Harvest	2,491	-3.
Roadless	PROD 3	>55	All Ages	Final Harvest	16,705	-31.
Roadless	PROD 2	>55	<40	Final Harvest	2,281	-47.
Roadless	PROD 1-2-3	All	NS **	Final Harvest	13,067	-351.
-----Management Area E1-----						
Roaded	PROD 1-2-3	<55	>40	Final Harvest	162,835	723.
Roaded	PROD 1	>55	>40	Final Harvest	39,094	475.
Roaded	PROD 1-2-3	<55	>40	Final Harvest	40,365	294.
Roaded	PROD 2	>55	>40	Final Harvest	14,829	170.
Roaded	PROD 1-2-3	<55	<40	Final Harvest	48,832	159.
Roaded	PROD 3	All	All Ages	Final Harvest	17,596	80.
Roaded	PROD 1	>55	<40	Final Harvest	2,865	71.

(Table B-2 cont.)

Roaded/ Roadless	Productivity		Age	Management Intensity	Acres Available	Weighted Average PNV Per Acre (\$)
	Class	Slope				
Roaded	PROD 1-2-3	<55	<40	Final Harvest	1,360	16.
Roaded	PROD 2	>55	<40	Final Harvest	665	-20.
Roaded	PROD 1-2-3	All	NS **	Final Harvest	26,464	-508.
-----Management Area E3 ^-----						
Roaded	PROD 1-2	>55	>50	Final Harvest	78,117	190.
Roadless	PROD 1	>55	>50	Final Harvest	35,108	184.
Roadless	PROD 1	>55	<50	Final Harvest	30,325	6.
Roadless	PROD 2	>55	>120	Final Harvest	35,640	-9.
Roadless	PROD 2	>55	<120	Final Harvest	2,752	-43.
-----Management Area M2 ^^-----						
Roaded	Riparian	All	>120	Uneven-aged	59,143	224.
Roadless	Riparian	All	>120	Uneven-aged	83,219	171.

* A4 and A6 Management Areas are modeled only to occur on less than 55 percent slope and productivity classes 1 and 2.

** NS - nonstocked.

^ E3 Management Area is modeled to only occur on greater than 55 percent slope and productivity classes 1 and 2.

^^ The analysis areas within M2 Management Area are riparian areas. The age class of the timber is assumed to be greater than or equal to 120 years.

A brief summary follows of the timber financial analysis results for Management Areas A4, A6, C4, C8s, E1, E3, and M2. It shows PNV's are always negative on Management Areas A4 and A6 except on roaded, productivity class 1 which occur on less than 55 percent slope in age classes greater than 120 years.

Where Management Area C4 applies, the only negative PNV occurs on nonstocked analysis areas.

PNV's on E1 Management Area are generally positive except on the analysis area groupings with the following characteristics:

- productivity class 2, greater than 55 percent slope, with a current age less than 40, or
- productivity class 2, less 55 percent slope, less than 40 years old.

In the E1 Management Areas on productivity class 3, the PNV's are around 0 with the trend to become negative as the current age of the stand becomes younger. As with the nonstocked stands in C4, they are also negative in Management Area E1.

On Management Area E3, the PNV is never negative on the roaded analysis areas. However, on analysis areas in productivity class 2, having a current age less

than 120 years in currently roadless areas, the PNV is negative. On productivity class 1, on roadless areas where the current age is less than 50 years, the PNV is generally around 0.

PNV's by individual management intensity and analysis area are in the planning records.

5. Designating and Scheduling

The condition classes of existing vegetation were used to schedule management activities over time for the various benchmarks and alternatives.

6. Monitoring

Forest planning data provide a base from which changes can be measured and will also be used to monitor implementation activities.

7. Plan Implementation Programs

The data base provides biological and physical data that will help develop subsequent programs for Forest Plan implementation. As more information is available, the data base will be updated and improved.

B. SOURCES OF DATA

Sources of existing inventory data used in the analysis are:

1. Forest Service Manual, Management Information Handbook (MIH 1309.11) provides definitions for outputs, activities, effects and other information.
2. Forest Habitat Types of Northern Idaho and Eastern Washington, J. Daubenmire, 1952, 1968.
3. Landtypes - Forest Service, Region 1 Guidelines.
4. Clearwater National Forest Management Plan - Timber Compartment, Map, 1979.
5. Clearwater National Forest Administrative Boundaries Maps, 1980.
6. Roadless Area Review and Evaluation (RARE II) Final Environmental Impact Statement, January 1979, USDA - Forest Service.
7. Forest Service Manual, Range Analysis, Handbook 2009.21, Chapter II, Sections 260-263.
8. Forest Inventory System. (FINSYS)
9. Recreation Information Management System (RIM).
10. Winter forage production estimates were formulated from unpublished studies from the Nez Perce National Forest, Clearwater National Forest, Idaho Panhandle National Forest, and Idaho Fish and Game Department.
11. Economics. Stumpage value originated from bidder transaction evidence for 1975 to 1980; price trends from Haynes and Adam, 1980; other resource values (price trends) from 1980 RPA reports; costs developed by Forest personnel as documented in

- Planning Records: Appendix (Economic Input), May 1982; economic impact analysis from IMPLAN I/O model, 1984.
12. Background Paper: Fisheries Resources Analysis of the Management Situation Clearwater National Forest by Al Espinosa, Forest Fisheries Biologist, 1984.

III. THE FOREST PLANNING MODEL (INCLUDING FORPLAN)

A. OVERVIEW

The planning model consists of informational and analytic techniques combined to address planning questions and issues. The major analytic model is called FORPLAN.

FORPLAN is a linear programming, computer model designed to analyze a set of possible management activities, practices, and resource outputs on specific land areas. It selects an optimal mix of outputs, practices and activities capable of meeting various management constraints and goals (objective functions).

The specific land areas, (analysis areas), were delineated by characteristics which have a uniform response to management activities, costs, and benefits. Management activities and practices were assigned to analysis areas according to their suitability. (See Part C of this section on page B-11.) Specific combinations of activities and outputs were assigned to analysis areas to represent various multiple use prescriptions called management prescriptions. Each of the 362 analysis areas has from 1 to 10 management prescriptions.

Resource outputs or production coefficients were developed for each combination of analysis area and management prescription. FORPLAN assigns management prescriptions to analysis areas which produce the goods and services that optimize the objective function.

Alternatives were generated by constraining management prescriptions available to analysis areas, by constraining the access to analysis areas for timber harvest in a particular decade, or by constraining the outputs from analysis areas or groups of analysis areas. These constraints were designed to achieve the goals of an alternative. The conditions set by the constraints had to be satisfied before the objective function was optimized. The analysis of the benchmarks and alternatives utilized the same objective of maximizing present net value. In other words, after meeting all constraints, FORPLAN designated the remaining opportunities to produce the most economic value.

Appendix B was revised, updated, and expanded to address public comments and internal concerns from the Draft Environmental Impact Statement (DEIS).

Changes made in Appendix B as a result of comments on the DEIS are:

- Economic analysis of timber prescription has been added in Section II of Appendix B.

-Alternative K has been added. A description of Alternative K and constraints used in FORPLAN are presented in Section VII. Results of Alternative K are provided in Section VIII, C.

-A discussion on timber supply and demand based on A Report on Idaho's Timber Supply has been added in Section VIII, D.

-Timber resource land suitability is discussed in Section VIII, D.

-Timber prices and trends were revised in the FEIS. Section VIII, E, is a new section and provides a sensitivity analysis of changing prices and trends.

-Non-interchangeable volume has been added to allowable sale quantity in all alternatives in the first decade.

-Management prescriptions, C2S and C6S, were combined to form a new management prescription, C8S.

-Modeling assumption and all costs of management were reviewed between the DEIS and FEIS. The major FORPLAN model changes are discussed and analyzed in Section VIII (E) of this Appendix.

Although other changes were made as a result of public comments and internal concerns about the DEIS, those listed above are the ones affecting this Appendix. For a more extensive list of the changes made as a result of comments on the DEIS, see Chapters 1, 2, and 6 of the FEIS.

B. ANALYSIS PROCESS AND ANALYTICAL TOOLS

The analysis leading up to FORPLAN included designing management prescriptions (planning record: Management Prescriptions); assigning practices to prescriptions (planning record: Economic Input Information); developing management costs for each practice; and predicting resource outputs and benefits (planning record: Economic Input Information & Effects Data).

Resource outputs predicted include timber yield, dispersed recreation, elk forage, range forage, sediment, and roads.

Cost efficiency was considered by the interdisciplinary team while they were developing a realistic and flexible set of management prescriptions. Professional judgment played a major role. FORPLAN was later used to examine the comparative cost efficiencies of prescriptions.

Analysis of yield coefficients resulted in changes in the following prescription practices: roading in riparian areas, road construction, road density, and timber management guidelines for reforestation, silvicultural systems, logging method and rotation age. The growth prognosis model was used to develop timber yield tables. Timber stands were categorized as existing (unmanaged) or regenerated (managed). (Wykoff and others, 1981)

FORPLAN was utilized to provide the basis for optimal land designations and management prescription selection and scheduling for each analysis area. This

process resulted in selection of the most cost-efficient management prescriptions and land designations that meet a given set of constraints and an objective function of maximizing present net value.

A social impact assessment and the identification of baseline socioeconomic conditions were developed for the local area. In addition, an efficiency analysis was used to determine the benefits, costs, and trade-offs associated with varying levels of outputs. This analysis is detailed in Section IV.

C. IDENTIFICATION OF ANALYSIS AREAS

The rationale for delineating analysis areas follows:

1. Level 1 Criteria

The six Ranger Districts of the Forest are defined as Pierce (PIERCE), Palouse (PALOUSE), Canyon (CANYON), Kelly Creek (KELLY), Lochsa (LOCHSA), and Powell (POWELL) in the original eleven alternatives.

The reasons for delineating by Districts are to meet administrative needs benefiting the Forest Plan implementation, to predict road costs and miles, and to predict sediment.

2. Level 2 Criteria

The current status of the Forest is defined as follows: Selway-Bitterroot Wilderness (WLNESS); Middle Fork-Lochsa Recreation River (W&SRVR); Lochsa Research Natural Area (RNA); nonforest, not capable, and unsuitable for regeneration (PROD-4); roaded (ROADED); and roadless (ROADLS).

The reasons for delineation are legal and administrative constraints, identification of lands unavailable and unsuitable for timber production, road costs and miles, elk numbers from summer range, primitive and roaded natural recreation, and the prediction of sediment.

3. Level 3 Criteria

Available and suitable timberlands are defined for wildlife as follows: winter range (WINTER); and key and regular summer range (SUMMER). The reasons for delineation are to predict elk numbers from winter and summer range.

4. Working Group Criteria

Available and suitable timberlands are identified by the following vegetative habitat type groups: grand fir-cedar-hemlock/pachistima group (PROD-1), alpine fir/pachistima group (PROD-2), mountain hemlock/menziesia group (PROD-3), and riparian (RIPARIAN).

The reason for delineation is to predict timber outputs over time.

5. Land Class Criteria

Available and suitable timberlands are further defined by slope classes:

Slope greater than 55 percent or breaklands (+55 percent);
Slope less than 55 percent or nonbreaklands (-55 percent).

The reasons for delineation are road miles and costs, logging costs, prediction of sediment, and prediction of primitive recreation.

6. Condition Class Criteria

Available and suitable timberland is defined by the existing condition: sawtimber (HR-SAW); immature sawtimber (I-SAW); poles (POLES); seedlings and saplings (SEDSAP); and nonstocked (NONSTK).

The reason for this delineation is to predict timber outputs for a short time period.

Originally eight condition classes were defined for FORPLAN. These were all-age; high risk sawtimber; overstory/understory; mature sawtimber; immature sawtimber; poles; seedlings and saplings; and nonstocked. However, this resulted in over 800 analysis areas when combined with level one through land class; thus the following criteria were defined to further group analysis areas.

- a. Condition classes all-age, high risk sawtimber, overstory/understory, and mature sawtimber were grouped into one sawtimber condition class called HR-SAW.
- b. Analysis Areas less than 200 acres were grouped into larger analysis areas. This aggregation resulted in the changes as displayed in the following table:

Table B-3. Analysis Area Classification Table

	<u># of Analysis Areas</u>	<u>M Acres</u>
Suitable	346	1328.916
Unsuitable & Not Capable	11	224.148
Not Available	5	284.052
Total	362	1837.116

The suitable acres in FORPLAN were less than the tentatively suitable acres. This was caused by the "not available" category in FORPLAN being defined differently than "Forest lands withdrawn from timber production." (See Table B-1.) In FORPLAN, analysis areas "not available" were defined as including the Selway-Bitterroot Wilderness, Lochsa Research Natural Area, and the Middle Fork-Lochsa Recreation River. Defining the recreation river as "not available" resulted in a decrease in the suitable land base. The recreation river was removed from the timber base, because timber harvest could not occur on a regulated basis as described in the standards and guidelines for the A7 (Recreation River) Management Area.

The 362 analysis areas and assigned prescriptions and entry times by prescription resulted in a model over 50,000 columns costing an average of \$400 per FORPLAN run. Additional analysis areas would have resulted in a larger model that could easily cost over \$1000 a run. For this reason the Forest did not stratify more than 362 analysis areas.

Trade-offs between spatial issues versus resource use and production issues had to be made in forming analysis areas. The spatial issue of how each inventoried roadless area should be managed could have been better addressed by defining each inventoried roadless area within the level 2 criteria. However, assuming the number of analysis areas could not exceed 362, further grouping of level 3 through condition class became necessary. This resulted in less sensitivity for FORPLAN coefficients that address production issues such as elk numbers, timber harvest, sediment, and logging costs. Doing this was considered unacceptable because of the importance of these issues.

D. IDENTIFICATION OF PRESCRIPTIONS

1. Overview

The NFMA regulations define management prescriptions as "management practices selected and scheduled for applications on a specific area to attain multiple use and other goals and objectives" (36 CFR 219.3). A management prescription is a set of treatments or practices to develop and/or protect a combination of resources on a particular landtype.

2. Design of Management Prescriptions

The ID team reviewed the public issues and management concerns. Using professional judgment, they consulted existing policy, legislative direction and research for guidance in developing multiple resource management prescriptions. This set of prescriptions portrays a broad range of management emphasis, intensities, management practices, standards and guidelines. The management standards and guidelines needed to accomplish the goals of a prescription include the necessary mitigation and resource coordination measures that are required by existing laws, regulations and policies.

Completed prescriptions received full review, discussion, and revision as necessary by the ID team. The ID team evaluated each prescription against the following criteria:

- a. Does this prescription adequately convey what the desired future condition will be of land managed under this prescription?
- b. Does the prescription provide the technical management direction needed by a land manager to achieve the stated future condition?
- c. Does the prescription provide the information needed for developing costs and outputs for FORPLAN?
- d. Does the prescription address the planning issues and concerns?

To fully explore appropriate, practical ways of managing the Forest for a variety of uses, the ID team developed a set of rules (that included economic and cost-efficiency considerations) to guide the assignment of management prescriptions to various parts of the Forest (referred to as "analysis area" in FORPLAN). Within the rules and limitations of the model, the team considered all management prescriptions appropriate for each of the analysis areas. The team based the assignment of management prescriptions on the land's inherent capability for resource production.

Current management practices were described as prescriptions so that the current management program could be compared with a number of alternatives. In addition, a series of prescriptions designed to maximize production of each individual output was created. These "single-purpose" (a matter of emphasis since multiple uses still occur) prescriptions permit the analyst to study the feasibility of meeting the RPA Program targets and to define the productive potential of the Forest. True multiple-use prescriptions are also used to address land use conflicts, issues, and concerns.

Other prescriptions had to be created so that the relative efficiency of alternatives could be explored. "Efficient use" of Forest land may be achieved by: (1) managing some lands for several purposes simultaneously ("multiple use"), (2) managing some lands with a single output emphasis, and (3) leaving some lands in a minimal state of management. To find an efficient management pattern, these three prescriptions were an option for each landtype represented in the model.

From this basic set of management prescriptions applied to the land, the team developed yield and cost-effect tables for use in modeling each prescription in FORPLAN. These prescriptions were used for the development of both benchmarks and alternatives. Screening was used to ensure the cost efficiency of the prescriptions.

For example, if a summer range analysis area was suitable for timber production and also had potential for roadless recreation, a prescription for each of these uses would be assigned to the analysis area. Depending on the objective of the alternative being tested, the analysis area in this example could have been designated to either one of the two management prescriptions.

Alternatives having similar outputs for some resources may differ because of various combinations of prescriptions and land designations. These differences are apparent when comparing the alternative maps.

3. Purpose, Criteria and Assumptions for Prescriptions

The prescriptions can be grouped into general categories by major resource element or application. The categories are timber, wildlife, fisheries, riparian, recreation, special areas, and custodial management.

The purpose of specific prescriptions within each category is to portray a management activity presently being practiced by the Forest, to respond to a particular issue or group of issues, and to provide a range of management options that could be applied to various land areas.

Mathematical relationships existing between prescriptions were also examined. This information is useful in the explanation of trade-offs that occur when numerous prescriptions interact within individual alternatives. Planning records contain detailed information.

a. Timber Prescriptions

(1) Purpose

The two prescriptions (E1, E3) included in this group provide cost efficiency of timber management, i.e., least expensive and most effective ways to maximize timber yield. The prescriptions also recognize and provide other resource uses which don't conflict with each other. These other uses include mineral exploration, elk summer range management, domestic livestock grazing, visual resources, and roaded natural recreation.

(2) Criteria and Assumptions

- All lands tentatively identified as suitable for timber would be assigned as suitable.
- A range of timber management intensities for existing and regenerating stands through the application of commercial and precommercial thinning, final harvest methods, and stand entry times would be provided.
- Even-aged silvicultural systems would be applied.
- Middle ground viewing areas as viewed from designated visual corridors would be managed for retention and modification. Background viewing area would be managed for modification and maximum modification.
- Road densities would be maximized to the extent necessary to meet timber harvest objectives but shall not exceed 16.7 miles per square mile in the first entry and 5.0 miles per square mile in later entries.
- Roads would be closed as needed to provide 25 percent potential elk habitat.
- Grazing would be provided when regeneration is established.
- Minimum rotation ages would be defined by 95 percent of culmination of mean annual increment (CMAI) or 80 to 120 years.

b. Recreation Prescriptions

(1) Purpose

Five prescriptions (A2, A3, B1, B2, A7) were developed to manage unroaded and essentially unroaded and undeveloped areas for dispersed recreation in semiprimitive and wilderness settings. Except for wilderness they provide the management of resources compatible with dispersed and unroaded recreation including elk habitat, fisheries, grazing, and the classified Wild and Scenic River system in the Forest.

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(2) Criteria and Assumptions

- Wild and Scenic River prescription would be assigned only to the Middle Fork-Lochsa Recreation River Corridor.
- Existing wilderness prescription would be assigned only to classified Selway-Bitterroot Wilderness.
- Other prescriptions would be assigned to all inventoried roadless areas and Elk Creek Falls area.
- Recommended wilderness prescription would be applied to all inventoried roadless areas.
- All commercial timberland would be designated as unsuitable, i.e., unavailable for commercial timber management.
- Retention visuals quality would be applied to all prescriptions except wilderness (which is preservation).

c. Visual-Historic Corridor Prescriptions

(1) Purpose

Two prescriptions (A4, A6) were developed to manage the visual resource (specifically retention and partial retention) and certain historic values. The prescriptions provide compatible management of other resources including timber, wildlife, fisheries, and range management as well as dispersed recreation in semiprimitive recreational settings and roaded natural settings.

(2) Criteria and Assumptions

- Prescriptions would provide visual quality objective of retention or partial.
- The visual corridor prescription would be assigned to all travel corridors (roads and trails) within areas suitable for timber management.
- The visual-historic corridor prescription would be assigned to the Lolo Motorway, Lewis and Clark Trail, Lolo Trail, and Nee-Me-Poo Trail.
- Both prescriptions would be assigned to riparian areas also but would be managed for visual, riparian, and historic values where applicable.
- Rotation age of timber would be extended to over 120 years.
- Harvest schedules would be designed to maintain age class diversity.
- Individual tree and small groups selection would be emphasized.
- Needs would be evaluated regarding withdrawal of specific cultural sites within historic corridors; otherwise they would provide maximum protection of historic values.

d. Wildlife Prescriptions

(1) Purpose

Six prescriptions (C3, C4, C2S, C1, C2, C8S) were developed to address the big-game issue, primarily elk habitat management, and to optimize elk on both winter and summer range. The prescriptions provide compatible management of other resources including timber, range and recreational management within three of the prescriptions and only recreational management within two of the prescriptions.

(2) Criteria and Assumptions

- Prescriptions would follow direction of the Guidelines for Evaluating and Managing Summer Elk Habitat in North Idaho.
- Prescriptions would be assigned to key winter and summer range only.
- On those areas incompatible with timber, elk habitat potential would be maintained at a 100 percent.
- On key big-game summer range compatible with timber, elk habitat would be maintained 75 percent of its potential.
- On key big-game winter range compatible with timber, elk habitat potential would be maintained at 50 percent.
- Roads would be closed to motor vehicles if and when conflicts with big-game occur.
- Natural regeneration in areas compatible with timber would be favored.
- Winter browse stands would be rehabilitated when analysis determines forage production is declining.
- A minimum of 25 percent thermal cover would be provided.
- Roads would be closed to motor vehicles on key summer range to provide 75 percent of maximum elk use.

e. Fisheries Prescriptions

(1) Purpose

The two fishery prescriptions (C6, C6S) were developed to address the sensitive issue of habitat management for westslope cutthroat trout and anadromous fish. One prescription provides compatible management of other resources including timber, wildlife habitat, range, and dispersed recreation. The other prescription provides compatible management of wildlife habitat, range, and dispersed recreation.

(2) Criteria and Assumptions

- Prescriptions would be assigned to inventoried roadless areas only and within watershed drainages critical to westslope cutthroat trout and/or anadromous fishery.
- Prescriptions would provide 100 percent of biological potential for westslope cutthroat trout streams under unroaded prescription.
- They would provide 80 to 90 percent of biological potential for westslope cutthroat trout streams under roaded prescription.
- They would maintain unroaded status and unsuitable for commercial timber production.
- They would provide a minimum of 75 percent elk use on key summer range, and close roads where necessary to meet the minimum population.
- A plan of transportation systems to achieve location, amount, and timing compatible with fish habitat and water quality would be implemented.

f. Riparian Prescription

(1) Purpose

The riparian prescription (M2) was developed to manage timber, livestock grazing, and recreation within perennial stream corridors while protecting and enhancing fish and wildlife species associated with this type of habitat. Elk habitat and visual quality management are compatible where applicable.

(2) Criteria and Assumptions

- Prescription would be assigned to all riparian areas suitable and available for timber management.
- Riparian vegetation would be maintained at 80 percent of natural levels for visual purposes.
- It would manage timber at 150 to 180 year rotation levels to maintain needed old-growth components. At the same time it would maintain a diversity of vegetation where needed.
- Timber harvest openings would be small and irregularly spaced.
- It would manage existing range allotments to achieve stable soil and stream banks.
- It would avoid new road construction paralleled to streams except at crossings.

g. Minimum Level Prescriptions

(1) Purpose

Two prescriptions (M5, M6) were developed to provide a custodial or status quo maintenance level of management, in one case, for all suitable lands and, in another case, for all available, but unsuitable, nonforest, noncommercial and lands that cannot be regenerated within five years.

These prescriptions provide compatible management of basic soil, watershed and fire protection, and range, dispersed recreation, and wildlife habitat management where applicable.

(2) Criteria and Assumptions

- These prescriptions would provide a mix of uses on unsuitable timberlands that are compatible with adjacent management activities except timber management.
- For suitable timberlands, they would maintain the basic productivity of the land excluding management of timber and wildlife habitat.
- They would classify all productive timberlands as unsuitable for timber management.

h. Special Areas Prescriptions

(1) Purpose

Two prescriptions (A5, M1) were developed to provide protection to administrative sites, industrial sites, developed campgrounds, and research natural areas. These prescriptions provide management to only those resources for which the areas were designated.

(2) Criteria and Assumptions

- Mineral withdrawal would be provided if conditions appear to conflict with the established use.
- Areas would be protected from fire.
- Research opportunities would be provided within research natural areas.

4. Use of Cost Efficiency in Developing Prescriptions

Cost efficiency was considered in developing prescriptions in the following manner:

Objectives, standards, and guidelines were established for each prescription by resource element. Given the objective of the prescription, costs were estimated under each resource element to meet the standards or guidelines of that prescription. Costs of producing the outputs from implementing the

- prescription were developed and compared to the benefit values. Prescriptions were carried forward if they were cost efficient in achieving outputs.

Three basic assumptions used in developing prescription costs were:

- Costs experienced in implementing past practices would be a reasonable basis from which to predict future costs;
- Funding for production of outputs would include only the necessary support funding; and
- No great changes in future budget levels could be predicted, and any change experienced would be directly related to the timber outputs.

5. List of Prescriptions

For purposes of analysis the prescriptions were defined into three categories: 1) prescriptions defined in FORPLAN, 2) prescriptions combined into one prescription and applied in the model, and 3) prescriptions applied outside of FORPLAN.

Prescriptions applied directly in the model are A7 (W&SRVR); C1 (SUMMER); C2 (SUM-TM); C3 (WINTER); C4 (WTR-TM); E1 (TIMBER); E3 (TM-AER); M1 (RNA); M2 (RIP-TM); M5 (PROD-4); and M6 (MINLVL). Prescriptions combined for the purpose of estimating outputs in the model are B1 and B2 (WLNESS); A2, A3 and C6 (PRIM); A4 and A6 (VIS-TM); C2S and C6S (SUM-75). Finally, a prescription applied outside of the model was A5.

Following are the prescriptions used in the analysis:

A2 Prescription:

Goal: Elk Creek Falls, special dispersed recreational area in the Palouse District, managed for nonmotorized use, primarily, hiking, picnicking, and scenic viewing.

A3 Prescription:

Goal: Dispersed recreational areas occurring in large blocks of undeveloped land (or smaller areas contiguous to wilderness or other undeveloped lands) managed for a variety of dispersed recreation. Provides big-game summer range management and livestock grazing where compatible with recreational and visual values.

A4 Prescription:

Goal: Travel corridors along designated roads and trails. Maintains or enhances natural scenic qualities and dispersed recreation. Modifies big-game summer range and timber management to meet key values.

A5 Prescription:

Goal: These sites include Ranger stations, work centers, lookouts, one emergency airfield, and 33 developed recreational sites including campgrounds, picnic areas and visitor information sites (VIS).

A6 Prescription:

Goal: Travel corridors along historic travel ways specifically Lolo Trail, Lewis and Clark Trail, Nee-Me-Poo Trail, and Lolo Motorway. Maintain historic

and scenic values. Modifies timber, range, and wildlife management practices to maintain key values. Provides VIS and dispersed recreation.

A7 Prescription:

Goal: Classified Middle Fork-Lochsa Recreation River Corridor managed for dispersed recreation, protection, and enhancement of the river environment, specifically water quality and visual resources. Provides big-game habitat and timber management when compatible with the key values.

B1 Prescription:

Goal: Manages the Clearwater portion of the 1,337,910 acre Selway-Bitterroot Wilderness according to the Wilderness Act, i.e., protects wilderness values and provides primitive recreation.

B2 Prescription:

Goal: Recommended wilderness. Protects wilderness characteristics. Two of the seven areas are contiguous to recommended wilderness on Idaho Panhandle National Forest (Mallard-Larkins) and Lolo National Forest (Hoodoo).

C1 Prescription:

Goal: Key big-game summer range. Maintains optimum (100 percent) big-game (mostly elk) habitat conditions through vegetative manipulation where needed but without road construction. Provides livestock grazing where compatible with elk use and high quality dispersed recreation.

C2 Prescription:

Goal: Big-game summer range managed for 50 percent elk forage and security through modified timber and range management. Emphasizes road closures where needed. Provides dispersed recreation.

C2S Prescription:

Goal: Key big-game summer range managed for 75 percent elk (and moose in Elk Summit area) habitat and protection of the animals in conjunction with timber management, livestock grazing, and dispersed recreation.

C3 Prescription:

Goal: Big-game winter range located generally on steep breaklands on south exposures supporting browse stands. Critical soils. May be suitable also for some dispersed recreation. Occurs in conjunction with C4, C1, C6, and A3 lands.

C4 Prescription:

Goal: Big-game winter range located generally on steep breaklands on north aspects supporting mixtures of browse and trees. Manages browse and timber production.

C6 Prescription:

Goal: Critical watersheds with high fishery stream values. Potential unstable or erosive soils preclude road construction. Permits other resource management activities and uses when compatible with fishery stream values. Generally highly suitable for dispersed recreation.

C6S Prescription:

Goal: Sensitive watersheds with high fishery stream values. Sensitive soils require special road construction and management practices in conjunction with modified timber management practices. Provides livestock grazing (where compatible with fish habitat protection) and dispersed recreation. Maintain 75 percent elk habitat.

C8S Prescription:

(Between the DEIS and FEIS, this new prescription was added. It combines prescriptions C2S and C6S to form a C8S prescription.) Key big-game summer range managed for 75 percent elk (and moose in applicable areas) habitat and sensitive watersheds with high fishery stream values. Sensitive soils require special road construction and management practices. Closes roads to protect wildlife in conjunction with timber management, livestock grazing, and dispersed recreation.

E1 Prescription:

Goal: Timber producing land managed for healthy timber stands to optimize potential timber growing. Timber production is cost effective and provides maximum protection of soil and water quality. Manages big game, primarily elk, through limited road closures. Provides dispersed recreation and livestock grazing if compatible with timber management goals.

E3 Prescription:

Goal: Timber producing land located on steep and/or unstable ground because of steep slopes, unsuitable for most other uses except some dispersed recreation. Manages timber using aerial harvest methods operating from roads on adjacent lands. Interspersed with E1 lands.

M1 Prescription:

Goal: One existing and nine areas proposed for research natural areas. Maintains natural and undeveloped state.

M2 Prescription:

Goal: Riparian areas located mostly along perennial streams. Management practices such as timber harvesting, grazing, and recreation are provided to the extent they protect and enhance riparian values (old-growth, aquatic ecosystems, water quality, and fishery and wildlife habitats).

M5 (US) Prescription:

Goal: Nonforest and low productive Forest lands not capable of producing crops of industrial wood and lands with apparent regeneration limitations. Provides management for soil and watershed protection.

M6 Prescription:

Goal: Forested land where most resource development is uneconomical or infeasible under current conditions. Maintains present condition with minimal investment levels.

More detailed information on the management prescriptions, practices, standards and guidelines and the rules for their assignments to analysis areas is available for review at the Forest Supervisor's Office. Table B-4 on the following page shows comparisons of prescriptions to standards and guidelines.

Table B-4. Prescription Comparisons								
Standards and Guidelines	Prescriptions						Min Level	Special
	Timber	Roadless Recreation	Visual	Wildlife	Fish	Riparian		
Road Density (miles/sq mi)								
1st entry	0-16 7	N/A	0-.20 5	0-10 0*	0-10 1*	0-4 0	N/A	N/A
Later entries	0-5.0	N/A	0-7 0	0-5 0*	0-5 0*	0-4 0	N/A	N/A
Timber Management								
Thinning	Yes	N/A	No	No	No	No	N/A	N/A
Even-age mgt	Yes	N/A	No	Yes	Yes	No	N/A	N/A
Uneven-age mgt.	No	N/A	Yes	Yes	Yes	Yes	N/A	N/A
Rotation Age (years)	80-120	N/A	120-160	80-120*	80-120*	120-160	N/A	N/A
Elk Habitat Management								
Habitat effectiveness (percent)	25	100	75	50-100	50-100	75	100	0-100
Wildlife and Fish								
Riparian road stds	Yes	N/A	Yes	Yes	Yes	Yes	Yes	No
Old-growth provision	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Visual Management								
VQO **	PR-MM	R	R-PR	PR-MM	PR-MM	PR-M	N/A	R-MM
Recreation (ROS) ***	RN	SP-P	RN	RN-SP	RN-SP	RN	RN-P	RN-N/A

* Prescriptions which involve timber harvest only (i e C2S, C4, C2, & C8S)

** R - Retention, PR - Partial Retention, M - Modification, MM - Maximum Modification

*** P - Primitive, SP - Semiprimitive, RN - Roaded Natural

E. DEVELOPMENT OF TIMBER HARVEST OPTIONS - INTENSITIES

Timber harvest options were developed for FORPLAN by considering the types of silvicultural treatments that are technologically feasible with the application of current management practices. Yield tables were developed to predict yields for those silvicultural treatment regimes utilizing the Growth Prognosis Model. Costs and revenues associated with these regimes were then developed.

Initially, all analysis areas suitable for timber management had all the timber options available. The only restriction was a practical limitation applied to harvest entries. Commercial thins were allowed to occur from 50 to 90 years; final harvests could occur following substantial CMAI. Allowing the model this wide range of choices resulted in a very large model (i.e., over 170,000 columns).

The following criteria were defined to reduce the size and to increase the efficiency of the model:

1. Timber options other than final harvest which showed a negative present net value for all entry times were eliminated from consideration on a given analysis area.
2. Commercial thins were reduced from 50 to 100 years to 50 to 70 years. This range was chosen because of higher present net values by allowing analysis areas to accumulated sufficient volume for a commercial thin.
3. Final harvests had to occur within 80 years after the analysis area had reached 95 percent of CMAI.
4. Only one timber intensity with the highest present net value was applied on analysis areas less than or equal to 300 acres.
5. A final harvest could not occur earlier than 20 years following a commercial thin (i.e., harvest cycle 2). A second commercial thin could not occur earlier than 20 years following the first commercial thin (i.e., thinning cycle 2).
6. For regenerated stands, commercial thins could only occur between 50 and 60 years and final harvest between 70 and 100 years. The range in ages was due to FORPLAN limitations. The ages selected were based on a present net value analysis.

The following is a list and explanation of the timber intensity options used in FORPLAN.

FINALH = Regeneration harvesting only. This option provided no precommercial or commercial thinning. It provided only hazard reduction/site preparation and regeneration.

PCTHIN = This option provided for a precommercial thin only and then a regeneration harvest along with hazard reduction/site preparation and regeneration.

COMTHN = This option provided a commercial thin only and then a regeneration harvest/site preparation and regeneration.

PCT/CT = This option provided a precommercial thin, a commercial thin, then a regeneration harvest/site preparation and regeneration.

COMTH2 = This option provided two commercial thins then a regeneration harvest/site preparation and regeneration.

PCT2CT = This option provided a precommercial thin then two commercial thins and a regeneration harvest/site preparation and regeneration.

Between the DEIS and FEIS, prescriptions that were used very little in the development of the DEIS were combined or deleted. For example precommercial thinning was incorporated with the final harvest (FINALH) intensity. Precommercial thinning now occurs on 15 percent of the acres receiving this intensity. All other intensities except commercial thinning (COMTHN) have been removed. These prescriptions were removed to allow the model to run more efficiently and give the opportunity to add more site specific criteria to help refine solutions and allocations.

F. DEVELOPMENT OF YIELD COEFFICIENTS

1. Overview

This section describes how the yields of each resource were calculated. For more information about yield calculations, see planning records, Effects Data.

a. Timber

Yield tables for the Integrated Forest Plan were developed by projecting timber management inventory stand data using the Growth Prognosis Model.* The Regional Office also developed a program by which groups of stands could be simulated, the summaries saved, and then weighted together to get a single yield table for that particular group. The advantage of this method over projection of a single representative stand lies in the weighting procedure. Each stand has a weighting factor based on the sampling procedure used in the Timber Management Inventory. A weighted yield table utilizing individual stand projections, species mix, tree diameter, and weighting factors results in a more accurate projection for the Forest than a single representative stand projection.

b. Recreation

Three scheduled outputs were defined in the model for dispersed recreation. These were recreational use for primitive and semiprimitive recreation; recreational use for roaded natural recreation; and the capacity for primitive

* Wykoff, W.R., N.L. Crookston and A.R. Stage, 1981. Users' Guide to the Stand Prognosis Model. Review Draft 6/22/81. Intermountain Forest and Range Experiment Station, Ogden, Utah. 201pp.

and semiprimitive recreation. The first two outputs were from past trends in use and population growth and were not sensitive to land designation. This analysis was completed outside of FORPLAN, because it is not dependent on the designations of other resource outputs.

The capacity for primitive and semiprimitive recreation was an important output in the model and was sensitive to land designations on roadless areas. All nontimber prescriptions, except wilderness, applied on roadless areas produced this output. Timber prescriptions in roadless areas produced primitive and semiprimitive recreation until implemented. This output was compared to predicted recreational demand for primitive and semiprimitive recreation.

Values were assigned by the following criteria: if capacity exceeded predicated use, only the use was assigned value; if use exceeded capacity, only the capacity was valued. Roaded natural recreation was assumed to have excess capacity in all alternatives.

Wilderness and developed recreations were determined outside of FORPLAN.

Between the DEIS and FEIS, the three scheduled outputs for recreation were removed from the model. During preparation of the DEIS it was found roaded natural recreation remained constant among alternatives, and semiprimitive recreation was modified extensively outside the model. As a result, these outputs served no purpose in the model, and the incorporation of other data in their place would provide a refined and more efficient model.

c. Elk

The yields analyzed in FORPLAN were elk numbers on both winter and summer range. The purpose in analyzing both outputs was to determine which limited elk population. From the benchmark analysis it was found that winter range was the limiting factor in the early decades and summer range in the latter decades. Summer range became limiting as more of the roadless areas were accessed for timber production.

Yield estimates on winter range varied by prescription and age with timber and burning prescriptions producing more elk than nontimber prescriptions. Elk winter range outputs were based on the philosophy that pounds of forage convert directly to carrying capacity expressed as elk/acre/decade. Calculations were from the following assumptions:

1. Average daily forage requirement is about 7 pounds/day.
2. Average number of days actually spent on winter range consuming browse is 90 days.
3. Average sustainable browse utilization is 65 percent use.
4. Approximately 90 percent of the total elk herd winter on the mapped key winter range. (i.e., FORPLAN outputs represents 90 percent of the actual total elk output on winter range.)

Winter forage production estimates were formulated from unpublished studies from the Nezperce National Forest, Clearwater National Forest, Idaho Panhandle National Forest, and Idaho Fish and Game Department.

Yield estimates on summer range varied by prescription and roaded vs roadless. Nontimber prescriptions applied to key summer range in roadless areas produced the most elk with timber prescriptions producing the least. Elk summer range outputs assumed the philosophy of open road densities: the higher the road density the fewer the elk.

Between the DEIS and FEIS, elk numbers on summer range were removed from the FORPLAN model. The reason for this is that winter range was generally the limiting factor in the production of elk.

d. Fisheries

Fish numbers were estimated outside of FORPLAN. Potential estimates were made for both anadromous and resident fish.

The effects upon fish populations from alternative development were predicted from sediment yields as determined by FORPLAN. The interface linkage used to integrate fisheries responses to sediment yield increases is the "revised version" of the Idaho Fish/Sediment Input Model (FISHSED) as developed by Stowell et al. (1984). The "key" parameters (variables) in this assessment were: sediment production over natural rates, channel type, cobble embeddedness, and subsequently a reduction in fish density.

Anadromous fish estimates were disaggregated between the DEIS and FEIS into steelhead trout smolts and chinook salmon smolts as a result of public comments. The smolt estimates were also reviewed and revised when necessary.

e. Range

Existing range was defined as a scheduled output in FORPLAN. The use estimate was based on assigned RPA targets by decade; thus the output was not dependent on the designation of other resource outputs. In estimating existing range use it was assumed that 9,788 AUM's are currently produced from permanent range (i.e., meadows), 5,960 AUM's from transitory range, and 720 AUM's from the Selway-Bitterroot Wilderness.

Because the output was not dependent on the designation of other resource outputs, it was removed for the model between the DEIS and FEIS to make the model more efficient.

Potential transitory range was estimated outside of FORPLAN. It was calculated on the philosophy that timber cutting increases forage production which provides Animal Unit Months. For all alternatives potential range exceeds the projected RPA targets.

f. Sediment

Sediment loading above naturally occurring levels was defined as scheduled outputs in FORPLAN. The outputs were estimates of the combined potential sediment increases as a result of road construction and logging. The coefficients varied by District, roaded vs roadless, and percent slope.

Coefficients were derived using the computer program, WATBAL, with runs on designated "planning watersheds" representing each roaded and roadless portion of a district. WATBAL simulates the potential and probable effects of Forest practices (timber harvest, road development, and fire) on watershed systems with respect to stream flow and sediment yields. Various factors used in the watershed models within WATBAL were also used in the development of the FORPLAN coefficients. In FORPLAN, the only practices assumed to generate sediment were those that involved roading and/or timber management. Many assumptions were necessary since FORPLAN analysis areas had lumped landtypes of extremely variable erosion and sediment into very general land units. In addition, the analysis areas used in FORPLAN were not watershed-specific.

Coefficients were developed independently for roads and timber harvesting, then were linearly added, from data consisting of the following (relative to each prescription): management regime; logging system (tractor, skyline, aerial); breaklands or nonbreaklands; and road densities.

Another controlling variable used in coefficient development was the geologic subsection (granite, belt, border) determined by finding the weighted average geologic parent material from the WATBAL data files. These were eventually averaged by roaded vs. roadless within each District.

More new roads would be built during the initial entry into an area than subsequent entries. This is due to the miles of road required to reach a particular harvest area. The sediment coefficients were adjusted to reflect this assumption. Initial entries into sawtimber analysis areas were assigned a higher coefficient than initial entries into younger analysis areas and later entries into all analysis areas.

The current conditions of the watersheds within the roaded analysis areas included elevated sediment loads caused by preplanning management activities. As a result, more restrictive sediment constraints were applied in the first two decades on roaded areas.

The sediment constraints were applied as water quality/fishery standards and were defined as follows:

<u>STANDARD</u>	<u>DEFINITION</u>
No Effect	No sustained, measurable adverse changes over time due to management-caused effects on turbidity, temperature, substrate composition, chemical quality; or physical loss or degradation of existing potential fish habitat potential. (For example, "threshold" levels of sediment should not be exceeded.)
High Fishable	Maximum short-term reduction of water quality that is still likely to maintain a fish habitat potential that support an excellent fishery relative to the stream system's natural potential, and that will provide the capability for essentially full habitat recovery over time.

STANDARD

DEFINITION

	<p><u>Quantitative description:</u> Maximum short-term sediment loading that is not likely to cause more than a 20 percent reduction from full biological potential of the habitat for the appropriate indicator species. Threshold levels of sediment should not be exceeded for more than 10 out of 30 years.</p>
Moderate Fishable	<p>Maximum short-term reduction of water quality that is still likely to maintain a potential fish habitat that can support at least a moderate harvestable population relative to the stream system's natural potential, and that will provide the capability for significant habitat recovery over time.</p> <p><u>Quantitative description:</u> Maximum short-term sediment loading that is not likely to cause more than a 30 percent reduction from full biological potential of the habitat for the appropriate indicator species. Threshold levels of sediment should not be exceeded for more than 10 out of 30 years.</p>
Low Fishable	<p>Maximum short-term reduction of water quality that is still likely to maintain a potential fish habitat that can support at least a minimal harvestable population relative to the stream's potential, and that will provide the capability for some significant habitat recovery over time.</p> <p><u>Quantitative description:</u> Maximum short-term sediment loading that is not likely to cause more than a 47 percent reduction from full biological potential of the habitat for steelhead; or more than a 36 percent reduction from full biological potential of the habitat for cutthroat. Threshold levels of sediment should not be exceeded for more than 20 out of 30 years.</p>
Minimum Viable	<p>Maximum short-term reduction of water quality that is still likely to maintain a potential fish habitat that can support at least a viable fish population, and that will provide the capability for some significant habitat recovery over time.</p> <p><u>Quantitative description:</u> Maximum short-term sediment loading that is not likely to cause more than a 66 percent reduction from full biological potential of the habitat for steelhead, or more than 48 percent reduction from full biological potential of the habitat for cutthroat. Threshold levels of sediment should not be exceeded for more than 20 out of 30 years.</p>

g. Roads

Two scheduled outputs were defined in FORPLAN for roads. One was miles of construction and reconstruction for local roads, and the other was miles of arterial and collector roads.

An attempt was made to define miles of arterial and collector roads by age, condition class, and breaklands vs nonbreaklands. This was unsuccessful, and miles were estimated outside of FORPLAN. Arterial and collector road miles can only be reasonably estimated on a contiguous geographic area (i.e., drainage). The spatial arrangement of the designation and scheduling is also necessary to make a reasonable estimate of this output. Drainages were not incorporated as part of the analysis area criteria because of the huge number of areas that would result. The estimates made in the model were considered unreasonable and were adjusted outside of the model. The miles were manually estimated by viewing a map of each alternative and then determining which roads were actually needed for development.

New local road miles were predicted adequately by the model. The coefficients were placed in the model under the same assumptions as the sediment coefficients. (See sediment section.) Miles of reconstruction were under estimated by the model and were adjusted outside the model.

Cost estimates were tied to the miles of road constructed. Arterial and collector road costs were placed in the model and then adjusted outside the model. Local road costs were estimated in the model, but they also were adjusted outside of the model to mirror the miles of local roads constructed and reconstructed. (See planning record documentation of computer program FORPLAN-STAT for more information.)

Between the DEIS and FEIS, the two scheduled outputs in FORPLAN were expanded to four scheduled outputs. The four outputs are: 1) aggregate local road miles, 2) aggregate arterial and collector road miles, 3) local road construction/reconstruction costs, and 4) arterial and collector road construction/reconstruction. This change was made to better model road costs.

IV. COST-EFFICIENCY AND NET PUBLIC BENEFIT

This section describes cost-efficiency criteria and explains how net public benefits are derived. This analysis is required by National Forest Management Act regulations (36 CFR 219) and plays an important part in the development, comparison, and selection of Forest planning alternatives.

A. NET PUBLIC BENEFITS

The purpose of the Forest planning process is to provide goods and services in an environmentally sound manner so that the public receives the maximum net benefit. Net public benefit is the overall value to the nation of all outputs and positive effects (benefits), less all the associated Forest inputs and negative effects (costs) of producing priced and nonpriced outputs from National Forest lands (36 CFR 219.3). Many priced benefits and all financial costs of management can be measured in dollars. However, nonpriced benefits

and some effects cannot be fully valued in financial terms or measured quantitatively. These nonpriced benefits still must be considered when determining which plan alternative provides the highest net public benefits.

Determination of net public benefit cannot be reduced to a single index. All of the information on benefits, costs and effects must be combined. Therefore, the decision on which alternative maximizes net public benefits is a subjective determination.

B. PRESENT NET VALUE (PNV)

PNV represents the dollar difference between the discounted value of all priced outputs and all Forest costs over the 150-year planning period. Two discount rates, 4 percent and 7 1/8 percent were used to represent the real cost of money over time. Priced outputs include those with market values (timber, range forage, and developed recreation) and those with assigned nonmarket prices (dispersed recreation, including wildlife and fish recreational values).

Each benchmark and alternative was designed to achieve its goals and objectives by producing the greatest PNV. This was accomplished by giving FORPLAN the objective of maximizing PNV while meeting the specified constraint(s) of the benchmark or alternative. The PNV calculated in FORPLAN is modified by including benefits and costs not modeled in FORPLAN. These were costs and benefits which do not influence and are not significantly influenced by land designations and output schedulings. The modified values were used to evaluate the benchmarks and alternatives. This section describes how the prices and costs were calculated.

1. Priced Output Parameters Used in PNV

a. Discounting

One discount rate representing the real cost of money over time was used to run FORPLAN and to calculate the economic consequences of the benchmarks and alternatives. The 4 percent rate approximates the real return on long-range corporate investments, above the rate of inflation (Row and others, 1981). Inflation was not included in the discount rates, benefits, and costs due to the difficulty of estimating future inflation rates, and because inflation would equally affect both costs and prices.

The 4 percent rate was used to run FORPLAN in all cases except one (Minimum Level) and is also the primary rate used to evaluate benchmarks and alternatives. The PNV of each alternative and benchmark was recalculated outside of FORPLAN at 7 1/8 percent for comparison purposes. All costs and benefits were discounted from the midpoint of the planning period.

b. Real Dollar Adjustments

All prices and costs are expressed in first quarter 1978 dollars. The Gross National Product (GNP) implicit price deflator index is used to inflate or deflate price and cost data to this common base (FSM 1971.32b).

2. Costs Used in PNV

All agency costs were estimated for the 150-year planning period for all benchmarks and alternatives. This section discusses how costs were developed, the major expenditure categories, funding source, and the actual costs by resource.

a. Cost Development Process

Costs were developed by Forest personnel in conjunction with developing standards and guidelines for management prescriptions. Resource specialists estimated cost for every management activity specified in prescriptions. The costs were based on historical data and professional judgment. Managers also approximated the minimum funds needed to achieve the standards and guidelines in the prescriptions. Cost data were used in developing feasible and cost-efficient prescriptions.

Costs dependent on land designations and timber harvest schedules were modeled in FORPLAN by entering them in the economic tables. By programming FORPLAN to maximize PNV, the cost-efficient level of agency expenditures for each designation was estimated for 150 years. Other costs which were not modeled in FORPLAN, were developed by the planning team to meet the objectives of each benchmark and alternative. The actual cost data are discussed later in this section. More detailed information on data sources and FORPLAN modeling procedures is in the Forest planning records.

b. Cost Categories

Costs were stratified into three classes: fixed Forest Service costs, variable Forest Service costs, and production costs (FSM 1971.52).

Fixed costs are assumed to be constant for all alternatives and were calculated outside FORPLAN. Fixed costs did not contribute to the FORPLAN objective that maximized PNV and did not affect land designations. These costs were added outside the model to the Forest costs, present value costs, and PNV. Fixed costs include general administration, long range planning and inventory, fire administration and operation construction, maintenance and replacement costs (exclusive of developed site facilities). Included in the fixed costs are costs for minimum management requirements, (MMR), which reflect the costs of activities necessary to meet legal requirements for insuring public safety, environmental protection, and limited safety for capital investments. The minimum management prescription includes only these costs.

Variable costs were calculated in FORPLAN. These represent the costs of Forest Service management practices that vary in amount, timing, and response to different landtypes and management objectives. Variable costs include such items as road construction, timber sale preparation, habitat improvement, range improvement, reforestation, fuel management, and trail construction. Each prescription has a unique set of variable costs. Variable costs were developed for all Management Information Handbook (MIH) resource elements. The cost of all nonscheduled management practices (those practices for which scheduling was

not determined within the FORPLAN analysis) are expressed as the average cost per acre per year. Costs of scheduled practices are per unit of output.

The only production costs are agency cooperator costs usually associated with logging. These costs were reflected in the output prices and were not directly treated as a cost.

In most cases, expenditures were appropriated through the normal federal budget procedures. Two exceptions were in-kind payments and special collections. In-kind payments are road construction and reconstruction which are performed by timber purchasers. These are deducted from timber receipts. Special collections involve most of slash disposal, site preparation, and reforestation costs following timber harvest. These are financed through special collection brush disposal and Knudsen-Vandenburg (K-V) funds.

c. Cost Increases

None of the basic Forest Service unit costs are expected to increase above inflation over time. However, real cost trends (Adams and Haynes, 1979) are used for non-Forest Service production costs.

d. Cost Data by Resource

Costs were associated with the resources, timber, roads, range, recreation/wildlife and other. The category, "other costs," included joint costs not based on any particular resource but included such items as fire protection and general administration.

Calculating present net value by individual resource may be misleading because the costs included expenditures required to produce, enhance, or mitigate more than one resource. For example, slash disposal costs may contain a cost to mitigate visual quality. This cost would appear in the timber category. Thus, the costs by resource output do not always have a direct relationship with the benefits by resource.

Recreation/Wildlife -- Five recreation/wildlife costs were calculated in FORPLAN. These are:

- Wild and Scenic River management
- Dispersed recreational management
- Wilderness management
- Big-game habitat management
- Wilderness planning and inventory.

These costs were considered variable because they affect land designations and scheduling of resource outputs, although the costs of Wild and Scenic River and wilderness management were held constant for all alternatives and benchmarks. The costs were reported per planning period for each alternative and benchmark. In addition to these costs, the following activities were added to the total recreation/wildlife cost estimates:

- Recreational planning and inventory
- Cultural resource management
- Visual resource planning and inventory
- Developed recreational management

- Private recreational management
- Threatened and endangered species habitat management
- Stream inventories
- Fish habitat restoration and improvement
- Recreation or VIS site construction/rehabilitation.

These costs do not vary by alternative and benchmark. They are considered fixed overhead, fixed capital investment or minimum level costs since they did not influence land designations or scheduling of resource outputs. These annual costs varied from .549 million dollars in decade one to .514 million dollars in decade four.

Range -- The costs of administering and maintaining a range program were considered variable costs, and were calculated in FORPLAN by use of the economic yield tables. These costs were reported by planning period for each alternative and benchmark. Range costs include:

- Range planning and inventory
- Range management
- Range forage improvement
- Range structural improvement.

Because of the demand ceilings on AUM outputs, and the fact that these program levels can be achieved under most management levels, range costs varied very little between alternatives and benchmarks, ranging from .054 million dollars to .063 million dollars per year.

Timber -- Most costs of timber management were considered variable and were calculated in FORPLAN. These costs include:

- Silvicultural review and evaluation
- Stand examination and prescription
- Reforestation
- Site preparation
- Timber stand improvements
- Timber sale preparation and administration.

Timber costs were entered into FORPLAN by the use of economic yield tables which assigned costs to specific prescriptions. These costs were calculated for each alternative and benchmark per planning period. In addition to these activities, the fixed, minimum level, and overhead costs for the following practices were added to the total timber costs:

- Timber planning and inventory
- Firewood administration
- Genetic tree improvement program.

Those costs were calculated outside FORPLAN and were assumed constant for all alternatives and benchmarks. These annual costs varied from .079 million dollars in decade one to .075 million dollars in decade four.

Roads -- Roads costs were considered variable and were calculated in FORPLAN. These costs include:

- Preconstruction and construction engineering

- Appropriated road construction
- Timber purchaser road construction/reconstruction (purchaser credit)
- Road maintenance.

These costs were reported per planning period for each alternative and benchmark in FORPLAN. Adjustments were made to the local road construction miles needed per decade, necessitating adjustments to the engineering and maintenance costs and to purchaser road credits. FORPLAN schedules road construction miles directly proportional to acres of timber harvested. This results in an under estimation of the miles of road needed in the early decades, because roads are needed to connect the new harvest areas to the existing road system. The total miles of road needed to complete the transportation system for a given alternative remained as calculated by FORPLAN; however, some road miles were shifted from later to earlier decades outside the model. Associated variable costs were also brought forward.

Other -- "Other" or joint costs constitute the balance of activities required to produce, enhance, or mitigate the resource programs already described. These costs are not separable among resource activities, but are necessary components of the Forest program. "Other" costs were calculated both in and outside FORPLAN as fixed overhead, capital investment or minimum level costs. They include the following activities:

- Water planning and inventory
- Water uses
- Water resource improvements
- Minerals management
- Human resource programs
- Special uses
- Land ownership
- Landline maintenance
- Rights-of-way
- Land management planning
- Soils management
- Trail construction and maintenance
- Facilities, administration, and operations (FA&O) construction and maint.
- Fire prevention
- Cooperative law enforcement
- General administration.

These costs vary little by alternative. They are considered fixed costs since they do not influence land designations or scheduling of resource programs. In decade one, these annual costs vary from 3.897 million dollars for Alternative A to 3.943 million dollars for Alternative I.

3. Budget Costs

Budget costs represent another cost approach and consist of the estimated appropriated costs of management for each alternative and benchmark. These costs were reported as annual averages for each of the 15 planning periods.

Budget costs were stratified into the following categories:

- Appropriated road construction/reconstruction

Operation and maintenance costs
Other capital investments.

A fourth category, purchaser credit road costs, was added to show the cost of construction purchaser credit roads for timber harvests. This cost was not included in the total budget costs, but was added to the total agency cost estimates used to calculate PNV.

Delineation of what activity costs were included in each category followed the guidelines discussed in FSM 1971.32b (R-1, ID No. 6) and were adapted where applicable.

Budget costs were calculated similarly to the method used to determine cost data by resource. Variable or allocation costs for each budget cost category were summarized from the FORPLAN economic reports by planning period for each alternative and benchmark. Fixed overhead, fixed capital investment, and minimum level costs for each budget cost category were then added to these summaries to determine the total categorical costs. The following is a summary of how each budget cost was determined.

Appropriated Roads -- Appropriated roads are that portion of the total capital investment costs associated with the construction and reconstruction of arterial, collector, and local roads that are paid for with appropriated funds. The total miles of road needed to complete the transportation system for a given alternative are calculated by FORPLAN but are adjusted for realistic timing outside the model. It was assumed that 86 percent of the arterial and collector and 17 percent of the local roads construction and reconstruction would be funded by Forest Service's appropriation for each alternative and benchmark.

Purchaser Credit Road Costs -- The purchaser-incurred costs of constructing and reconstructing local and minor collector roads required for timber harvest operations were included in the cost analysis to provide a true cost estimate of management activities. It is assumed that while these costs are purchaser-incurred, they do constitute direct government expenditures since timber revenues are paid to the purchaser for construction of these roads. They also constitute a portion of the allocation costs used in designation and scheduling within the FORPLAN linear program. Purchaser credit road costs were reported separately, because they do not constitute an appropriated fund required for implementation of any given alternative but are necessary to produce timber outputs.

The total miles of road needed for timber harvest for each alternative and benchmark were calculated by FORPLAN and adjusted for timing. It was assumed that 14 percent of the arterial and collector and 83 percent of the local road construction and reconstruction for each alternative and benchmark would be funded with purchaser road credits.

Other Capital Investments -- Other capital investment costs included the portion of road construction costs funded by purchaser credits discussed above, as well as, capital expenditures associated with other resources.

The following are other capital investments that were calculated by FORPLAN and vary by benchmark and alternative:

- Range forage improvements
- Range structural improvements
- Stand examinations
- Reforestation
- Site preparation - slash disposal
- Timber stand improvements
- Arterial and local preconstruction and construction engineering
- Arterial road construction (purchaser credit)
- Local road construction (purchaser credit)
- Trail construction and maintenance.

Overhead capital investments were fixed for all alternatives and benchmarks. These included the following activities:

- Developed recreational management
- Threatened and endangered species habitat management
- Fish habitat restoration and improvement
- Genetic tree improvement program
- Fire administration and operation
- Facilities, administration, and operation construction and maintenance
- Land acquisition
- Right-of-way acquisition.

These costs were calculated outside FORPLAN and were constant for all alternatives and benchmarks. They varied from 1.306 million dollars in decade one to 1.294 million dollars in decade two and all subsequent decades.

Operations and Maintenance Costs -- Operations and maintenance costs include activities required to keep capital assets at agreed levels of service and availability, and activities required for producing controllable outputs (FSM 1971.32b, R-1 ID No. 7). Operations and maintenance costs were calculated as a summation of periodic costs reported in the FORPLAN economics reports for each alternative and benchmark, and a fixed level of overhead costs calculated outside FORPLAN. This fixed level of costs varied very little by planning period and ranged from \$4.487 to 4.815 million dollars annually. Operations and maintenance costs included in FORPLAN were derived from the following activities.

- Wild and Scenic River management
- Dispersed recreational management
- Wilderness management
- Deer and elk winter range management
- Range planning and inventory
- Range management
- Timber sale preparation
- Road maintenance.

Fixed overhead operations and maintenance costs added to FORPLAN costs included the following activities:

- | | |
|--------------------------|--------------------------|
| -Stream inventories | -Minerals management |
| -Firewood administration | -Human resource programs |
| -Water uses | -Land ownership |

- Water resource improvements
- Rights-of-way
- Land management planning
- Transportation planning and inventory
- Fire prevention
- Search and rescue
- Cultural resource management
- Soil management
- Developed recreational management (RSM)
- Private recreational management
- Recreational horse grazing permits
- Free-use firewood administration
- Water resource administration
- Minerals management
- Special use permits
- Threatened and endangered species habitat maintenance
- Landline maintenance
- Road maintenance (custodial)
- Trail maintenance
- Fire prevention
- Law enforcement
- General administration
- Recreational planning and inventory
- Visual resource planning and inventory
- Timber planning and inventory
- Water resource planning and inventory
- Soils planning and inventory
- Facilities, administration, and operations maintenance
- Soils management.

4. Benefits Used in PNV

All priced benefits were estimated for the 150-year period for all benchmarks and alternatives. Priced outputs included those resources that are or could be exchanged in the marketplace including timber, range, and recreation (including hunting and fishing). This section discusses the methods used to estimate current and future values.

The prices used in the analysis reflect on site values for all resources, i.e., the value of the resource in the Forest. The values are consistent with cost estimates for activities which produce onsite resources. Benefits were classified as market values (timber, range, developed recreation) or nonmarket values (dispersed recreation). Gross receipts included actual dollar value received by the government and in-kind payments such as purchaser road credits. These receipts serve as a base for 25 percent fund payments to local governments. Finally, some of the benefits are fixed. These benefits are associated with the minimum level benchmark and are the benefits associated with a minimum or custodial level of management.

a. Timber Benefits

Stumpage values represent both the benefit value to the taxpayer as well as the actual gross receipts to the United States Treasury. All timber outputs from the Forest are expected to be consumed.

Projections of real increases in stumpage prices were made for the 1980 RPA program and are used in this analysis (Adams and Haynes, 1980). These projections are based, in turn, on separate projections of lumber prices and production costs (logging and manufacturing costs plus profit). Using the residual value formula, the relationship between these factors is:

$$SV = LP - PC$$

where: SV = stumpage value/mbf
 LP = lumber price log scale (end product value)
 PC = production costs

the permittee. The receipt value is \$2.06/AUM which is an average value for 1980.

The value of the range program associated with the Minimum Level Benchmark is the value of the current program until allotments expire. The value in other benchmarks and alternatives were calculated by applying appropriate prices to the livestock forage schedule in FORPLAN.

c. Recreation/Wildlife Benefits

The value assigned to recreation reflects potential dollar returns from recreation to the taxpayers even though most dollar values are not actually collected by the Forest. The value is the difference between the total value of a recreational experience to the recreationist and the cost of participating. The prices varied by type of experience and were expected to increase in the future. The values for the Forest are displayed in Table B-6.

Recreation is projected to increase as the population in Idaho increases. Recreation visitor day (RVD) estimates made for each setting represent a mix of activities occurring in the same setting in the past. The values assigned to RVD's in a particular setting are applying a weighted average value based on the mix of activities in that setting. Currently recreational yield tables project outputs for four recreational settings: (1) roaded natural, (2) primitive and semiprimitive nonwilderness, (3) wilderness and (4) developed. Values determined per RVD are: \$5.17/RVD, \$5.57/RVD, \$9.23/RVD and \$3.64/RVD respectively (big-game hunting is valued separately and has been excluded from these values).

Table B-6.

Current and Future Prices for Recreation
(1978 Dollars, \$/recreation visitor day)

	1985	1995	2005	2015	2025+
Big-game Hunting	21.00	22.05	24.99	27.93	31.50
Other Hunting	24.00	25.20	28.56	31.92	36.00
Wildlife Viewing	29.00	30.45	34.51	38.57	43.50
Fishing	15.75	15.75	17.96	19.37	22.05
Wilderness	8.00	8.00	9.12	9.84	11.20
Other Dispersed Recreation	3.00	3.15	3.37	3.99	4.50

Source: FSM 1970 R-1, 1981.

Recreational capacity coefficients are based on the acres of each recreational setting available. Demand or projected use will exceed capacity sometime during the planning period for all recreational settings except roaded natural. All alternatives meet the demand for this type of recreation, and each RVD of projected use is valued (less big-game hunting). For the other three recreational settings, projected RVD's of use for each decade are valued (less big-game hunting) until capacity is reached and then the RVD capacity is valued.

Currently FORPLAN contains scheduled outputs for big game produced on both winter and summer range. The numbers are based on habitat carrying capacity coefficients which vary by prescription.

The method of determining the recreational value of big-game hunting in each prescription was to determine a ratio of expected RVD's of big-game hunting per animal. Based on 1980 data of 13,500 big-game animals and 60,500 RVD's of big-game hunting, a ratio of 4.5 RVD's per animal at \$25.49/RVD was assumed. This is a value (including price trends) that reflects real value increases over time and is based only on the recreational value attributable to hunting big game. The total value for big-game hunting is equal to the value-per-hunting-RVD "times" 4.5 "times" the carrying capacity of the most restrictive big-game habitat (e.g., smaller of the summer or winter range).

Receipts from developed recreation and special use programs result from fees paid at campgrounds and for special uses. Based on actual collections from 1972 to 1981, fees were projected to continue at \$17,000 to \$30,000 per year.

Much of the recreational value is fixed, i.e., it is not a result of active management.

d. Minerals Benefits

Receipts from the mineral program are fees paid for prospecting, permit rentals, mineral leases, and royalties. The value is \$850/year in the first decade and \$1200/year in later decades.

e. Water Benefits

Water was not assigned a price in the analysis, because most of the increase in water production occurs during the spring runoff when no additional storage capacity exists.

f. Anadromous Fishery Benefits

The value of the anadromous fishery was derived from a summation of total recreational and commercial value which can be attributed to annual smolt production. In other words, this represents total on-site and off-site values associated with a specified level of fish reared in the Forest. Since there are only minimal sport catches of smolts in the Forest, most of the value is represented by the commercial and sport catch of adult fish in the ocean and during their return migration (i.e., offsite values). This approach assumed that all downstream benefits are dependent upon the Forest providing suitable habitat for reproduction of fish; if the habitat is not available, then the fishery would not exist. The recreational value used for anadromous fish was \$58.50 per visitor day, the commercial value used was \$1.61 per pound.

C. NONPRICED BENEFITS

Nonpriced benefits are benefits which do not have available market transaction evidence. There is no reasonable basis for making market value estimates which are comparable to priced output values. Nonpriced outputs are valued through

quantitative values other than financial terms or valued subjectively. Nonpriced benefits affect issues that are not directly addressed by the alternative PNV comparisons. More nonpriced benefits often result in reduced priced outputs (lower PNV). The major nonpriced benefits are listed below.

1. Community Stability

A nonpriced benefit of National Forest management is to maintain a viable economic base insuring trades and professions within dependent communities. The contribution to potential employment with respect to Forest resource outputs was not considered in present net value.

Alternatives were evaluated by comparing the average annual changes in employment resulting from increases or decreases in Forest outputs. The comparisons were made to the base year (1980) employment in the regional area (Latah, Idaho, Lewis, Nez Perce, and Clearwater Counties in Idaho and Mineral County in Montana). The economy in this region has historically been resource-oriented, with a high proportion of employment dependent on Forest resource outputs. The Forest's contribution accounts for 3,038 jobs, or 10 percent of the total employment base.

The effect of these changes was evaluated with respect to economic stability, or "rapid change." As defined, rapid change in the regional area would be disrupted if increases or decreases in Forest resource outputs created a 15 percent or greater change in potential employment, income, and job distribution within a 10-year period. (See Section V-G for a further discussion.)

2. Threatened and Endangered Species

The importance of maintaining or enhancing suitable habitat for threatened and endangered (T & E) species was considered equally in all alternatives. T & E species managed in the Forest are the gray wolf, bald eagle, and grizzly bear. The value of the T & E species management was not included in PNV.

Differences in the degree of resource management needed to protect T & E habitat were used to compare alternatives. As stated, each alternative provides for the management of T & E species habitat, but those alternatives which propose the greatest level of development will require more intense management to reduce conflicts among competing land uses. This is especially apparent with respect to road closures after timber harvesting to reduce the effects of human intrusion. Alternatives which limit development should not require an intense level of coordination. To evaluate this relationship among alternatives, the amount of development in inventoried roadless areas was analyzed. The present inventory of these roadless areas is 950,311 acres excluding wilderness.

3. Cultural Resources

Protection of known historic and prehistoric cultural areas and the evaluation and protection of undiscovered sites are addressed equally under all alternatives. The value of these sites is not included in PNV. Those alternatives which have the greatest level of land-disturbing activities (i.e.,

timber harvest) will lead to the earliest analysis of cultural resource sites in the nonclassified portion of the Forest. (Cultural inventory in classified areas is performed in response to specific requests and is not affected by any alternatives.)

4. Dispersed Recreation

The value of dispersed recreation has been accounted for in the determination of PNV for each alternative. However, quality variations significantly above or below average were not considered in PNV calculations; for example, PNV values are based on average quality assumptions.

Total potential dispersed recreation for all alternatives exceeds projected demand. This is due to an increase in roaded recreation resulting from more roads. In each alternative, semiprimitive recreation decreases as fewer areas remain unroaded. The quality of this recreation (outside the wilderness) will decline, as the potential for overuse of the remaining roadless areas increases. The change in semiprimitive recreation for each alternative could affect wilderness use and cause a decrease in the opportunity to experience solitude.

Areas designated to roadless nonclassified prescriptions were used to evaluate the quality of semiprimitive recreation. Inventories show that approximately 1,209,476 acres or 66 percent of the Forest provides semiprimitive recreation.

5. Wildlife Habitat

The value of big-game (elk) habitat, as it relates to the number of recreation visitor days, has been accounted for in PNV, but the effect on big-game habitat of timber harvesting has not been addressed in this value.

Timber harvest on elk summer range habitat will utilize the Guidelines for Evaluating and Managing Summer Elk Habitat in North Idaho for all alternatives, but the degree of habitat utilization will vary by alternative. Managing for optimum elk habitat and managing for timber create potential conflicts between these resources. Those alternatives which harvest more area have the greatest potential for conflict. As more area becomes accessed for timber harvest, the probability of conflict increases. While conflict can also occur in unroaded areas, the chances are greatly reduced.

6. Visual Quality

The value of providing visual quality in sensitive areas is not included in PNV. Decreases in PNV occur when timber harvest is spatially constrained by time periods and cutting practices to achieve an assigned visual quality objective (VQO) of retention or partial retention. These changes are addressed as a reduction in PNV. The goals differ by how much emphasis is placed on achieving the VQO's. The current inventory identifies approximately 154,900 acres as retention or partial retention. All wildernesses have a preservation VQO.

7. Anadromous Fisheries

The value of anadromous fisheries potential habitat, as it relates to recreational and commercial opportunities, has been included in PNV. The maintenance of habitat to provide a harvestable surplus of fish was not considered in this value. Alternatives were evaluated by considering to what degree they provide potential habitat to produce a harvestable surplus of steelhead and chinook smolts in the Lochsa and Clearwater River drainages.

At present, the Forest is maintaining 80 percent of the potential biological habitat in the two major drainages. All alternatives maintain potential habitat above minimum viable levels.

8. Old-Growth Dependent Species

The importance of maintaining adequate habitat for old-growth dependent species was treated equally in all alternatives as a minimum management requirement. Every alternative was modeled to insure that at least 5 percent of each watershed would remain in old growth, and that old-growth habitat would be maintained on 10 percent of the land base Forestwide. The value of old-growth habitat is not included in PNV, although decreases in PNV occur when timber harvest is spatially constrained by time periods to achieve old-growth habitat.

Conflicts from timber harvest on adjacent land may result in more intense levels of resource management to maintain suitable old-growth habitat. Alternatives which provide levels of old-growth habitat exceeding ten percent will have a greater probability of reducing these conflicts. Each alternative was evaluated on the basis of how much old-growth habitat will be maintained Forestwide.

9. Special Areas

Establishing Research Natural Areas (RNA's) serves to expand the knowledge of unusual biological, geological, or animal features and provides ecological benchmarks. The value of these areas are not included in the PNV calculation. Existing RNA acres total 1,281.

V. SOCIAL AND ECONOMIC IMPACT ANALYSIS

A. OVERVIEW

Social and economic impact analysis estimates the relationship of Forest activities to people. Short-term impacts are of primary concern with consideration given to long-term effects (over 10 years).

Forest related economic impacts on employment, income, and state and local government revenues are directly related to the social well-being of people in the impact area. Additionally, the population's lifestyles, attitudes, beliefs, values, and social organization are linked to Forest management activities.

B. IMPACT ANALYSIS AREA

The Forest's impact area was defined as the multi-county area receiving at least three-fourths of the resource flows from the Forest (Ceperley, 1979). Resource flows are defined as the movement of Forest goods and services to consumers.

The selected area was assumed to contain most of the economic and social impacts related to the Forest's activities. It includes Mineral County, Montana and the Idaho counties of Clearwater, Idaho, Nez Perce, Latah and Lewis. This six county impact area is based on economic influences and is assumed to include most of the area within which social and economic effects would occur. Table B-7 shows the percent of resource flows to this "primary impact area."

Table B-8 shows estimated resource flow percentages for the larger areas initially considered, and Table B-9 describes the resources considered.

Table B-7. Percent Resource Flows to the Primary Impact Area

(Clearwater, Idaho, Nez Perce, Lewis, Latah, Mineral (MT) Counties)

<u>Resource Flows</u>	<u>Resource</u>
97%	Land Area
76%	Timber
76%	Firewood Permittees
38+%	Dispersed Recreation
35+%	Wilderness Use
84%	Minerals
100%	Human Resources
99%	Grazing

Table B-8

Resource Flows to Counties as a Percent of Total Clearwater NF Output (F Y 1987)

Resource	<u>IDAHO</u> <u>COUNTIES</u>								<u>MONTANA</u> <u>COUNTIES</u>					
	Clw	Idaho	Nez Perce	Lewis	Latah	Benewah	Shoshone	Other Idaho	Missoula	Mineral	Other Montana	Washington	Oregon	Other/ Unknown
Land Area	44	48	0	0	5	1	2	0	0	0	0	0	0	0
Commercial Timber	31	22	*	*	15	7	0	0	10	8	6	0	1	0
Firewood	11	3	5	7	49	*	*	10	1	1	1	12	0	0
Recreation-General Dispersed		32			6	*	*	11	10			6		35
Wilderness Use		19			16	*	*	10	19					36
Minerals	64	16	0	4	0	0	0	4	0	0	0	8		4
Human Resources	82	9	0	9	0	0	0	0	0	0	0	0	0	0
Grazing	0	11	4	9	75	0	0	0	0	0	0	0	1	0

* Included in "Other Idaho"

Table B-9.

Source of Resource Data Considered
in the "Primary Impact Area" Analysis

<u>Resource</u>	<u>Data Source</u>
Land Area	Land Area of Clearwater NF as of September 30, 1979. Source: John Underwood
Commercial Timber	Report of uncut volume under contract as of September 30, 1979 by location of mill to which timber is hauled. Source: Annual report of uncut volume, SO, & District Resource Clerks.
Firewood	Addresses of free use permittees - F.Y. 1979. Source: District Resource Clerks.
Dispersed Recreation	Recreation based on Recreation Information Management (RIM) reports for F.Y. 1979. Source: County distribution based on estimates and studies by District personnel (includes hunting and fishing).
Wilderness	Wilderness use based on RIM reports for F.Y. 1979. Source: County distribution based on estimates and studies by District personnel.
Minerals	Residences of those filing "notices of intent to mine" during F.Y. 1979. Source: District personnel
Human Resources	Residences of enrollees in Clearwater NF Human Resource Programs (YACC, YCC, YOC, SCSEP). Source: Directors of Programs
Grazing	Residences of holders of grazing permits on September 30, 1979. Source: District personnel

C. ECONOMIC IMPACT MODEL

An input-output model (IMPLAN) was used to estimate the employment and income impacts of Forest outputs and activities. Direct, indirect, induced, and total impacts were calculated.

Economic input-output (I-O) analysis is a procedure for describing the structural interdependencies of a regional economy or impact area and serves as a short-term predictive model for evaluating the impacts of shifts in Forest outputs and activities.

I-O analysis is based upon the interdependence of production and consumption sectors in the impact area. Industries must purchase inputs from other

industries, as well as primary sources like natural resources, for use in the production of outputs which are sold either to other industries or to consumers.

Flows of industrial inputs can be traced via the I-O accounts to show linkage among the industries in the economy. The accounts are also transformed into a set of simultaneous equations that permit the prediction of economic effects resulting from changes in Forest outputs and activities.

I-O analysis is based on assumptions that limit the accuracy of projections. Therefore, the numbers presented are more useful as relative indicators rather than absolute projections.

1. IMPLAN Data Base

The I-O model data base consists of (1) a national level technology matrix and (2) a county-by-county file of estimated activity levels for total gross output, six components of final demand, three components of final payments and employment for 466 industrial/business sectors. (See USDA Forest Service, 1983, for more information on the I-O model.)

The national technology matrix is based on a 1972 Commerce Department I-O model converted to an industry by industry basis and updated to 1977 (Clopper and others, 1974). The county level information is based on a 1977 data set constructed by Engineering Economics Associates of Berkeley, California.

Utilizing the national technology matrix and the regional control totals for the local impact area, a data reduction method was used to develop a regional input-output table. The method used the property of "openness" displayed by regional economics compared with the national economy (Richardson, 1972).

Smaller regional economics exhibit much greater tendencies or are more open to import and export than is observed at the national level. Based on the assumption that trade balances are the principal difference between national and regional purchase patterns, the supply-demand pool technique for data reduction was adopted (Schaffer and Chu, 1969).

2. Final Demand Expenditures

The I-O model translates Forest outputs and activities into employment and income impacts. An intermediate step is the translation of outputs into final demand dollars. Final demand expenditures are different from the values used in the efficiency analysis and represent the dollars spent by consumers for the finished products derived from Forest outputs. For instance, timber is processed into lumber which has a sale value at the mill. Assuming that most is sold outside the impact area, sale value represents the amount of new money that will be directly generated to the local impact area. The efficiency analysis examines only stumpage or the market value of the raw material that leaves the Forest.

This modeling step is accomplished by applying a final demand expenditure per unit of output to total outputs and linking the resulting dollar amount to the

sectors in which the direct expenditure takes place. This process determines the change that takes place in the existing economy. Expenditure information is contained in the planning records.

3. Profile of Six-County Area - 1977

Displayed in Table B-10 are IMPLAN labels which provide an economic profile of the six-county area consisting of Clearwater, Idaho, Nez Perce, Latah, and Lewis Counties in Idaho and Mineral County in Montana.

Table B-10. Current Situation of Employment by Sector

<u>Sector</u>	<u>Emp. Comp (MM\$)</u>	<u>Total Gross Output(MM\$)</u>	<u>Employment (# of Jobs)</u>
1 Total - Misc. Agriculture	11.3	160.8	1930
3 Meat Animals, Misc. Live	0.7	24.2	159
17 Total - Metal Mining	0.1	0.2	10
33 Total - Misc. Mining	1.3	3.9	37
51 New Construction	8.0	25.2	833
52 Maintenance and Repair	4.3	8.9	275
57 Total - Misc. Manufacturing	20.8	68.7	1230
59 Total - Food and Kindred	4.6	25.9	327
136 Total - Logging and Sawmill	98.9	537.2	5676
139 Total - Other Wood Products	1.9	9.5	231
142 Veneer and Plywood	8.9	40.0	526
165 Paperboard Mills	9.6	41.9	493
420 Total - Trans Comm Util	25.5	78.6	1518
432 Total - Wholesale and Retail	56.0	129.3	5925
434 Total - FM Insurance & Real Est.	11.2	107.3	1049
441 Hotels and Lodging Places	1.2	3.3	354
442 Total - Misc. Services	34.4	80.3	3997
447 Eating and Drinking Places	12.2	37.6	1995
458 Total - Gov't. Enterprise	7.3	23.1	491
466 Scrap, Used, and Secondhand	0.0	1.1	0

Table B-11. Employment by Aggregate Sector

<u>Aggregate Sector</u>	<u>Employment Compensation (MM\$)</u>	<u>Employment (Number of Jobs)</u>	<u>% Employment of Six-Counties Total</u>
Agriculture	12.0	2089	8
Wood Products	119.3	6926	26
Trade	56.0	5925	22
Service	59.0	7395	27
Others	71.9	4722	17
Total	318.2	27057	100

Of the 27,057 total jobs, 75 percent occur in the wood products, trade, and service aggregate sectors. This represents 20,246 jobs. The wood products aggregate sector represents approximately 37 percent of total employment compensation in the six-county area.

D. BASE YEAR EMPLOYMENT AND INCOME INFORMATION

Forest outputs for 1980 were identified and analyzed with the I-O model to provide a base situation from which employment and income changes could be measured. Table B-12 contains 1980 outputs levels, employment and income amounts associated with 1980 outputs, and the response coefficients per unit of output. Table B-13 shows employment and income for alternatives and benchmarks.

Table B-14 portrays the employment, by economic sector, for the six-county area in 1977 and the employment attributable to each alternative. This table provides the following information:

- The first column shows the number of jobs that each sector provided in 1977. The column also displays the total number of jobs provided in each of three aggregate sectors: wood products, trade and services, and other. The total number of jobs attributable to the Clearwater in all sectors (1980 base) and the total number of jobs in the six-county area is also shown.
- The remaining columns display the number of jobs by sector and alternative, and the total number of jobs which can be attributed to management of the Clearwater National Forest. These columns also display the total number of jobs by the aggregate sectors.

A summary of this information along with additional information on the economic impacts of each alternative on the six-county area can be found in Chapter II of the EIS.

Table B-12. Clearwater National Forest Outputs and Unit Coefficients - 1980

Output	Units	1980 Production	Employment			Income		
			Direct Jobs	Total Jobs	Jobs/ Unit	Direct M\$	Total M\$	M\$/ Unit
Softwood Sawtimber	MMBF	155.0	701	1807	11.7/MMBF	12486	42739	\$276/MMBF
Picknicking	MRVD	55.2	22	34	.6/MRVD	237	464	\$ 8/MRVD
Camping	MRVD	123.4	49	77	.6/MRVD	529	1038	\$ 8/MRVD
Downhill Skiing	MRVD	13.9	37	58	4.1/MRVD	306	673	\$ 48/MRVD
Water-Based Recreation	MRVD	27.5	8	12	.4/MRVD	72	151	\$ 6/MRVD
Dispersed Nonmotorized Recreation	MRVD	222.8	144	227	1.0/MRVD	1243	2744	\$ 12/MRVD
Dispersed Motorized Recreation	MRVD	345.2	233	367	1.1/MRVD	1875	4292	\$ 12/MRVD
Big-Game Hunting	MRVD	54.6	47	74	1.4/MRVD	552	1044	\$ 19/MRVD
Small-Game Hunting	MRVD	12.0	5	7	.6/MRVD	50	96	\$ 8/MRVD
Nongame Wildlife	MRVD	11.8	8	13	1.1/MRVD	50	129	\$ 11/MRVD
Fishing	MRVD	57.4	16	25	.4/MRVD	149	310	\$ 5/MRVD
Livestock	MAUM	16.4	2	12	.7/MAUM	60	284	\$ 17/MAUM
Common Minerals	MTON	311	6	12	.04/MTON	400	502	\$ 2/MTON
Forest Operations Maintenance and Capital Investment	MM\$	9.427	88	149	15.8/MM\$	1255	2328	\$247/MM\$
Forest Salaries	MM\$	4.775	94	153	32.1/MM\$	1583	2655	\$556/MM\$

Table B-13. Forest-Related Employment and Income
for Alternatives and Benchmarks

Alternatives	Jobs		Income (M\$)	
	Decade 1	Decade 5	Decade 1	Decade 5
A (cd)	3383	6498	66540	128963
B	3923	7491	79102	152620
C	3770	7218	75565	146113
D	3340	6373	65498	126033
E	3132	5992	60627	117063
E1	2979	13292	56863	287722
F	3132	6007	60648	117407
G	3514	6777	69454	135243
H	2897	5549	55216	106168
I	2638	5064	49254	94527
J	3340	6378	65505	126109
K (pa)	3395	7475	67082	152916
<u>Benchmarks</u>				
M05	9573	9026	207303	188428
PR2	5950	11074	125803	235566
PC3	2725	9676	50585	202839
PC4	6164	9777	130558	205583
PM4	5313	9842	110863	207100
PN3	5022	9279	104105	194381
PP1	4890	9001	101096	187594
PS2 (Max. PNV)	5014	9053	104076	188928
MU1	4904	8989	101413	187304
MW1	4942	9013	102385	188092
MIN (Min. Level)	895	1754	11298	21685
EL2	3454	4425	68039	80170
TIM	5474	9086	114204	189190
WL2	2914	5178	57346	100654
AA5	3462	6508	68222	130126
Base 1980 *	3038		59629	
Base year data				
1977 **	27057		604898	

* Forest-related direct, indirect and induced employment and income for the base year 1980.

** Total employment and income for the selected impact area.

Table B-14

Employment Summary

Employment by Sector in Number of Jobs - Average Annual Decade 1														
	1977 6-County		Alternatives											
	Employ	Total	A	B	C	D	E	E1	F	G	H	I	J	K (pa)
<u>Wood Products</u>														
Total - Logging & Sawmill	5676		647	811	766	633	568	514	576	688	501	425	633	659
Total - Other Wood Products	231		94	118	111	92	83	75	84	100	73	62	92	96
Veneer and Plywood	526		177	221	209	173	155	140	157	188	137	116	173	180
Paperboard Mills	493		172	216	204	168	151	137	153	183	133	113	168	175
Total - Wood Products	6926		1092	1366	1290	1066	957	866	970	1159	844	716	1066	1110
<u>Trade/Service</u>														
Total - Wholesale & Retail	5925		753	847	820	747	711	684	711	777	670	626	747	733
Total- FM Ins & Real Estat	1049		103	118	114	102	96	92	96	107	90	82	102	102
Hotels and Lodging Places	354		255	262	260	255	252	252	252	257	249	245	255	258
Total - Misc Services	3997		479	544	525	475	451	434	449	495	422	390	475	472
Eating and Drinking Places	1995		333	360	352	331	321	314	321	340	309	296	331	324
Total-Trade/Service	13320		1923	2131	2071	1910	1831	1776	1829	1976	1740	1639	1910	1889
<u>Others</u>														
Total Attributed to Clearwater in all Sectors	3038		3383	3923	3770	3340	3132	2979	3132	3514	2897	2638	3340	3395
Total Number of Jobs in Six-County Area	27057													

E. ECONOMIC IMPACT OF OUTFITTERS AND GUIDES

1. Economic Impact

The tourism/recreational industry is growing and currently is the third largest industry in the State of Idaho. The outfitter and guide segment has grown an average rate of six percent per year from 1970 through 1984 (Lansche, 1985). Anticipated demand for dispersed recreation in the Clearwater National Forest is expected to increase about 50 percent between 1981-2010. This projection was calculated from an adaptation of the Pacific Northwest River Basin Commission estimates of recreation in the States of Washington, Oregon, and Idaho.

An economic impact study of the outfitter and guide 1983-84 season estimated that \$36.1 million dollars and 647 jobs were contributed to the State of Idaho's economy (Lansche, 1986). An update of the study done for 1984-85 showed increases to \$38.5 million in aggregate spending and 712 full time jobs. These estimates indicate the importance of the outfitter and guide sector to the economy of Idaho.

In the Clearwater National Forest, outfitter and guide operations in 1985 provided about 12,000 recreation visitor days. This is approximately two percent of the total dispersed recreation.

Thirty outfitters provide hunting, fishing, and other services in the Forest. Three commercial outfitters provide floating services on the Lochsa and Middle Fork of the Clearwater River. Table B-15 shows gross receipts reported by the outfitters and guides to the Forest Service by selected activity for the years 1984-86. Table B-16 shows selected guided and nonguided recreation by activity in the Clearwater National Forest.

Table B-15. Outfitter Reported Gross Revenue
Clearwater National Forest

<u>Year</u>	<u>Hunts/Other</u>	<u>Floats</u>	<u>Trail Rides</u>	<u>Total</u>
1986	\$1,036,288	\$32,142	\$4,970	\$1,073,440
1985	\$ 945,630	\$35,370	N/A	\$ 981,000
1984	\$ 785,723	\$52,570	N/A	\$ 838,293

Table B-16.

1985
Dispersed Recreation by District
Guided and Nonguided (Recreation Visitor Days)

<u>Activity</u>	<u>Pierce</u>	<u>Palouse</u>	<u>N. Fork</u>	<u>Lochsa</u>	<u>Powell</u>	<u>Total</u>
<u>Big Game Hunting</u>						
Out/Guide	406	315	4,800	1,200	1,850	8,571
Non-O/G	8,874	25,785	22,600	8,700	8,650	74,609
	-----	-----	-----	-----	-----	-----
Total	9,280	26,100	27,400	9,900	10,500	83,180
<u>Watercraft</u>						
<u>Floating</u>						
Out/Guide	0	0	0	800	100	900
Non-O/G	0	0	1,300	2,400	350	4,050
	----	----	-----	-----	-----	-----
Total	0	0	1,300	3,200	450	4,950
<u>Fishing</u>						
Out/Guide	16	0	300	200	100	616
Non-O/G	2,908	11,100	40,900	2,400	3,600	60,900
	-----	-----	-----	-----	-----	-----
Total	2,924	11,100	41,200	2,600	3,700	61,516
<u>General Rec</u>						
Out/Guide	N/A	N/A	100	1,600	100	1,800
Non-O/G	N/A	N/A	331,950	28,600	N/A	360,550
	-----	-----	-----	-----	-----	-----
Total			332,050	30,200	100	362,350
					Out/Gde	11,887
					Non-O/G	500,109
					Total	511,996

It has been determined that approximately \$13,660 of client fees collected by outfitters are required to provide employment for one seasonal licensed guide (Lansche, 1985). To determine direct employment attributable to outfitting and guiding in the Clearwater, total fees collected in 1986 (\$1,073,440) are divided by \$13,660 which results in 79 seasonal guide jobs. Personal conversations with representatives of the Idaho Outfitters and Guides Association indicate this figure appears low; as a result, seasonal guides were estimated at 158 and camp cooks/tenders at 70. In addition to the guides, the owners of the outfitting and guiding operations are also considered as direct employment. Total direct employment is estimated as:

35	outfitters
158	guides
70	camp cooks/tenders
263	total jobs (seasonal basis)

To determine total jobs provided in the local area as a result of outfitting and guiding operations, direct employment can be multiplied by a 1.53 multiplier.*

$263 \times 1.53 = 402$ total seasonal jobs

Total economic impact from outfitting in the Clearwater in 1986 can be calculated as follows:

Client fees reported by O/G	\$1,073,440
License fees **	54,445
Other services **	<u>246,140</u>

Total receipts (Clw area) \$1,374,025

It is estimated approximately 19 percent of the total receipts flowed out of the State in the form of outfitter services and nonresident guide salaries (Lansche, 1986). Therefore, total direct economic impact on the local Clearwater area may be calculated as follows:

Total receipts	\$1,374,025
Minus 19%	<u>- 261,065</u>
Local direct receipts	\$1,112,960

To calculate total impacts, indirect impacts must also be considered. To determine total impacts, a multiplier is applied to total direct receipts as follows:

Local direct receipts x multiplier of 2.5 (Lansche, 1986)
 $1,112,960 \times 2.5 = \$2,782,400$

Therefore, total economic impacts on the Clearwater area from outfitting and guiding is estimated at \$2,782,400 including about 402 seasonal jobs.

In addition, the Clearwater National Forest collected approximately \$39,300 in 1986 from outfitters and guides for their use of National Forest Lands. Twenty-five percent (or about \$9,750) of these fees were returned to the local counties for roads and schools.

2. Forest Plan Impacts on Outfitter and Guiding Operations

There are great opportunities for expansion of outfitting and guiding in the Clearwater, and the business is expected to continue to grow over the next several decades no matter which alternative might be selected for the Forest

* Based on process and procedures developed by Lansche, 1985.

** Based on process and procedures developed by Lansche, 1986.

Plan. Based on reported outfitter and guide client receipts their businesses grew 17 percent from 1984 to 1985 and nine percent from 1985 to 1986.

The selected direction in the Forest Plan will have some effect on which types of activities have potential to grow the fastest. Market-oriented alternatives would provide more opportunities for developed or roaded natural recreation. Amenity-oriented alternatives would emphasize activities such as backcountry hunting, fishing, and general recreation; the types of activities closely associated with the local outfitter and guide industry.

Other factors also may limit opportunities to expand operations. Outfitters and guides in Idaho have exclusive hunting territories and almost all available territories in the Forest are currently utilized so the opportunity for new operations is very limited. Only expansion of existing operations is possible and these opportunities may be limited by the availability of nonresident tags. Total nonresident elk and deer tags are not expected to increase over a total of 15 percent during the next 10 years (IF&G, 1986).

Opportunities to provide float trips are also limited by lack of suitable water in the Clearwater for floating; however, opportunities for expansion do exist in this area. Summer outfitted sightseeing trips have high potential for expansion, both in more developed areas and back-country areas.

F. RETURNS TO THE U.S. TREASURY AND LOCAL GOVERNMENT

Predicted returns to the U.S. Treasury and local governments for each alternative and benchmark were calculated in the analysis to show the effects on revenue programs administered by the Clearwater National Forest. These returns illustrate the impact of management on both Federal Government receipts collected, and the resultant change in revenues passed on to local government. Comparisons were made between the average annual returns per period for each alternative and benchmark and the base year (1980).

Returns to the U.S. Treasury were calculated by deriving the revenue of income producing programs which correspond to FSM 6531.12b "Annual Collections Statement," or the National Forest Fund. Total treasury returns were broken down into three categories: timber, grazing, and other (includes recreation, land use, power, and mineral fees).

Timber returns were calculated for each FORPLAN run from the net value of timber revenues (Economics Report 6). Grazing returns were also calculated from the FORPLAN analysis per period for each alternative and benchmark. Other returns were calculated as the sum of fees collected for recreation, land use, power, and minerals. Table B-17 summarizes the base year returns to the U.S. Treasury.

Table B-17. Base Year Estimates - Returns to the U.S. Treasury 1980

<u>Resource</u>	<u>U.S. Treasury Returns (1978\$)</u>
Timber	\$5,140 M
Range	\$16 M
Other	\$13 M
TOTAL	\$5,169 M

Returns to local governments are Treasury funds paid to the State of Idaho and eventually passed to local governments resulting from revenue producing programs. The basis of this fund is discussed prior to Table B-17. Also included in the base value are collections for Knudsen-Vandenburg (KV) and purchaser road credits. Calculation of returns to local governments are defined as:

$$\text{Returns to Local} = .25 \times (\text{Returns to U.S. Treasury}) \\ \text{Government}$$

G. WORK FORCE

Shifts in Forest Service work force (measured as Full Time Equivalents - FTE) were calculated to show the change in government employment resulting from increases or decreases in land management programs for each alternative and benchmark. Adjustments were made to the base year level (445 FTE) according to the following assumptions:

- For all alternatives and benchmarks, the Forest will maintain a stable base work force for all programs except timber and roads.
- Employment in the timber program will vary by 2.5 FTE for every 1.0 MMBF of sell volume (assume volume change greater than 15.0 MMBF).
- Employment in the roads (engineering support) program will vary by .8 FTE for every 1.0 MMBF of sell volume (assume volume change greater than 15.0 MMBF).

H. SOCIAL MEASURES

Social impact analysis is the estimation of how Forest Service policies and actions affect the quality of life or social well-being. This is accomplished by projecting future social conditions in an area influenced by Forest Service actions if current management continued, then comparing this projection with conditions resulting from implementing management alternatives.

Social measures include two aspects of social impact analysis: social variables and social zones of influence. Social zones of influence identify who is affected by Forest Service activities, and social variables define how people

are affected and the relationship between people and the natural environment.

1. Social Zones of Influence

The following discussion is a description of the groups of people or communities within the impact analysis area.

a. Local Zone

The local zone of influence (Clearwater, Latah and Idaho Counties) is closely aligned to the Clearwater National Forest because of geographic location, historic reasons for settlement, economic dependency, and traditional use patterns. All three counties were first settled because of mining activities. Development of agriculture and cattle ranching occurred in the early 1900's, when farmers and ranchers settled the Weippe, Camas, and Palouse Prairies. With the exception of timber, the historical industries have remained stable since that time. The local area is still predominantly rural and primarily dependent upon three major industries: cattle ranching, agriculture, and timber products. The stable demand for products produced by these industries has had a direct impact on the slow but steady growth pattern in the dependent communities within the Counties.

Since traditional leisure activities such as firewood cutting, hunting, and fishing are so important to local lifestyles, a close relationship exists between Forest management activities and residents of the local area. An estimated 35 percent of the Forest's recreation originates within the local influence zone. The Clearwater National Forest comprises 44 percent of Clearwater County, 48 percent of Idaho County, 5 percent of Lewis County, 2 percent of Shoshone County and 1 percent Benewah County land ownership.

b. Regional Zone

The regional zone constitutes the major market area within which the direct, indirect, and induced impacts of Forest management activities and outputs apply. It encompasses the multi-county area of Clearwater, Idaho, Lewis, Latah, and Nez Perce Counties in Idaho and Mineral County in Montana, and includes the region's primary service center at Lewiston. The economy in the regional area reflects the impact of Lewiston in the market area.

The major sectors, by employment, are Forest products (6926 jobs or 26 percent), wholesale retail trade (5925 jobs or 22 percent), miscellaneous services (3997 jobs or 15 percent), and agriculture (2089 jobs or 8 percent). Contributions of Forest resource outputs to the regional economy, based on employment, are reflected in Table B-7 on page 47.

Population in the regional area has remained stable over the last two census periods. With the exception of Nez Perce County (Lewiston area), no real growth trends are apparent. This can be accounted for by the stable demand for both agricultural and Forest products; both mainstays in the regional economy.

Other than manufacturing of market products, the primary importance of the Forest in the regional area is for recreation. There is a large group that uses the Forest for recreational pursuits; an estimated 50 percent of the use

is by people from the multi-county area. Fishing and hunting are the major activities.

Forest-users in the regional zone of influence have shown a strong attachment to and interest in how it is managed. A number of public interest groups, as well as individuals, have taken an active part in helping shape Forest management priorities. This is often expressed as appreciation for amenity or aesthetic values. Except for aesthetics, even dramatic changes in Clearwater Forest outputs are perceived as having only limited effect on the regional economy and almost no effect on the personal lifestyles of most of its residents.

c. National Zone

The national zone of influence is not significantly affected by response to changes in Forest outputs for a given level of management. For instance, a change in timber output would not significantly vary supply or demand on a national scale. However, changes in policy affecting amenity values such as scenic, water, and similar values will continue to draw attention from special interest groups at the state and national levels. This is evidenced in the past by these interest groups' involvement in issues regarding roadless area designation.

Anadromous fishery and elk management also draw national attention as the Clearwater National Forest is considered to be one of the best elk producing country in Idaho, and Kelly Creek has received national recognition as a blue ribbon cutthroat trout fisheries.

d. Nez Perce Tribe

The Nez Perce Tribe is a unique special interest group among Forest users because the Forest Service has the responsibility to protect Tribal treaty rights, and the Tribe's freedom to believe, express, and exercise their traditional religions within National Forests. This responsibility is re-emphasized in the National Forest Management Act of 1976 and the American Indian Religious Freedom Act of 1978. As expressed by the Tribe, their primary concerns have been protection of sites of cultural and religious importance, and enhancement and perpetuation of anadromous fisheries and big game herds as they relate to hunting and fishing rights guaranteed them through various treaties.

A dramatic change in current wildlife and fisheries levels could impact traditional Tribal lifestyles as they relate to use of the Forest. Protection of cultural and religious sites is less affected by changes in output because protection needs are identified on a project-by-project basis through consultation with the Tribe.

Because few Tribal members are employed directly by the Forest Service or in occupations dependent upon Forest outputs, any dramatic change in current output levels is not likely to affect their employment status.

2. Social-Economic Variables

To measure or quantify the social effects of the alternatives, a common quantifier was used to evaluate changes in the social-economic variables. Input-output modeling of the regional area economy showed that variations in employment, gross output, and personal income resulting from changes in Forest resource outputs could have a significant impact. As a result, the change in employment and personal income, by alternative, in the regional area was used to quantify these changes. It was assumed that modeling of the regional economy could be used not only to predict changes in the social variables for that area, but also for the local impact zone as well. Specifically, comparisons were made of the change in forest industry employment, forest industry income, total employment, and total income to the base level (1980) outputs.

Although there are other factors that could affect the social variables, current data suggest that National Forest outputs can make a substantial difference in the social makeup of the impact areas identified. It should also be understood that many variables outside the realm of alternative outputs exert considerable influence. These would include the recent economic recession, or the inclusion of new industries into the market area.

Five variables were defined to quantify the impact of social factors in each zone of influence regarding the varying outputs of the different alternatives. These are economic stability, social stability, community cohesion, lifestyle, and aesthetics. Following is a discussion of each variable.

a. Economic Stability

This variable is the ability to maintain a viable economic base to insure the existence of historic trades and professions. This situation enables the affected community to maintain or enhance a way of living which may be financially dependent upon particular resource-related work. This variable is applicable most directly to the local zone and secondarily to the regional zone.

The ideal level, as perceived by local residents, is to maintain or minimally increase present employment and/or income levels. Drastic reductions or increases would be viewed as detrimental, since they would alter existing business patterns.

The most critical factor would be a drastic change in timber outputs because of the local dependence on timber production. Not only would this directly alter forest industry income and employment, but the indirect effects would be felt in the other sectors of the local and regional economics. To measure the effects of the alternatives with respect to economic stability, it was determined that timber outputs should not invoke "rapid change." This was defined as a 15 percent or greater deviation from base employment, income, or job distribution within a 10-year period. The regional I-0 model verifies that a volume range of ± 39 MMBF from the 1980 Base volume (155 MMBF) would serve to maintain current Forest related employment within this 15 percent range. This leaves a range of 129 MMBF to 194 MMBF within which harvest could vary without invoking "rapid change" during the first decade.

b. Social Stability

Social stability is an environment which maintains existing social and cultural ties to minimize conflicts with user groups. This variable is applicable only to the local area.

The local area is perceived to be both stable and capable of providing a high level of continuity among the citizenry. While stability was a very important concern, slow but steady growth (with respect to population and employment) is also viewed as advantageous. Any alternative which would create a sudden increase or decrease in population would be viewed as undesirable.

c. Community Cohesion

This variable addresses the degree to which individuals and groups support or denounce broad-based social issues. It is important only at the local level.

In general, the local area can be categorized as being in agreement on land resource issues, although a certain degree of polarization exists over environmental vs. market output questions.

There is a high level of community pride, and a strong sense of association within the local area. Alternatives must promote or maintain this cohesiveness to be acceptable.

d. Lifestyle

This variable pertains to preserving the traditional way of living commonly associated with Clearwater, Idaho and Latah Counties and the local subareas within them. It is important to note that most of the local people view their lives as being centered around individuality, freedom, permanency, and a strong identification with the area. Although moderate change in this lifestyle is not viewed as detrimental, most individuals would prefer to see little or no change.

e. Aesthetics

Many people consider amenity values (preservation of wilderness, clean air, clean water) as the most important factors, while others maintain that use of the Forest for timber harvest, grazing, firewood cutting, hunting, etc., are more important issues. In addition, this variable can be measured on the regional and national levels since many of these same values are important to the surrounding communities and to the nation as well.

VI. ANALYSIS PRIOR TO DEVELOPMENT OF ALTERNATIVES

A. INTRODUCTION

The primary analysis prior to developing alternatives was the analysis of the management situation (AMS). This is a determination of the ability of the Forest to supply goods and services in response to society's demands. This analysis provided a basis for formulating a broad range of reasonable

alternatives by examining the following:

- The minimum level of management with associated costs and benefits.
- The maximum potential of physical and biological production of single resources as well as sets of resources with their associated costs and benefits.
- The maximum present net value of resources with an established market value or an assigned value (a cost efficiency measure).
- A point of reference from which the costs and effects of constraints were measured.
- Analysis of the current and expected future level of goods and services if current management direction continued.
- Projections of demand for goods and services.
- Analysis of the potential to resolve issues and concerns.
- Analysis of the need to change management direction.

The results of this analysis form the framework within which alternatives were developed.

B. DEVELOPMENT OF MINIMUM MANAGEMENT REQUIREMENTS (MMR's)

The minimum management requirements in 36 CFR 219.27 are as follows:

1. Conserve soil and water resources.
2. Minimize hazards from flood, wind, wildlife, erosion, and other natural physical forces.
3. Reduce hazards from pest organisms.
4. Protect riparian zones.
5. Provide diversity.
6. Provide fish and wildlife habitat to maintain viable populations.
7. Follow multiple-use laws.
8. Protect threatened and endangered species habitat.
9. Provide rights-of-way and corridors.
10. Develop road construction standards.
11. Revegetate temporary roads.
12. Maintain air quality.
13. Reforest in 5 years.
14. Limit Forest openings to 40 acres.

The methods used to meet these minimum management requirements included:

- Developing standards and guidelines and appropriate practices for management prescriptions,
- Assigning management prescriptions and intensities to analysis areas in FORPLAN, and
- Applying access, scheduled output and inventory constraints to analysis areas or groups of analysis areas in FORPLAN.

In this section, each minimum management requirement and the way the Clearwater dealt with each are discussed.

1. Conserve Soil and Water Resource

The basic soil, watershed, and water resources are protected by applying a constraint in the FORPLAN model that limits sediment production to levels that are expected to at least maintain the integrity and stability of stream channels, and to manage water quality and fish habitat at levels no less than those necessary to maintain a minimum viable fishery. This constraint was applied to eleven areas defined by the roaded and roadless portions of each District.

The basis for the "integrity and stability" requirement is the purpose statement for the creation of National Forests in the Organic Act of 1897 to "secure favorable conditions of water flows." The water quality requirement is an interpretation of the Multiple-Use Sustained-Yield Act of 1960, the Clean Water Act Amendments of 1972, the National Forest Management Act of 1976, and others requiring that waters be managed at "fishable and swimming" levels, and that Federal agencies must meet State and Federal water quality laws.

Special mitigation measures will be necessary to maintain a minimum viable fishery on the Palouse District. The Palouse and Potlatch River systems have been significantly disturbed by past management practices. To continue timber harvest on this District and still meet an acceptable level of sediment, road densities below five miles per square mile will be needed. The mitigation measures necessary are: 1) Estimated Yarding Distances (EYD) should be increased from 800 to 1700 feet for tractor logging; 2) EYD should be increased from 800 to 1000 feet for conventional logging; and 3) EYD should be increased from 1200 feet to 1500 feet for intermediate logging. These measures would lower the road density to 4.66 miles per square mile. (See planning records, "Forest Plan-Logging Systems-Palouse District.") The District can therefore harvest timber at slightly below current levels and meet minimum viable fisheries. However, logging costs would increase with a resulting decrease in stumpage returns.

2. Minimize Hazards From Flood, Wind, Wildfire, Erosion, or Other Natural Physical Forces

The Forestwide management standards and guidelines incorporated in management prescriptions include the necessary mitigation and protection from the hazards listed in the title of this section. For instance, wind could cause unnecessary damage to residual trees in timber sale areas if improper silvicultural systems have been applied. This hazard is minimized by prescribing silviculturally sound systems by working group or habitat type.

3. Reduce Hazards From Pest Organisms

Activities to prevent conditions favorable to pest organisms are included in the management prescriptions. Trees in the Forest are susceptible to tussock moth, mountain pine beetle, and spruce budworm outbreaks.

4. Protect Riparian Zones

Riparian areas are defined as all wetlands and floodplains, and the adjacent lands that directly influence water bodies such as streams, rivers, and lakes.

The Forest further defines riparian areas as the land that exists within approximately 100 to 250 feet (depending on the stream-order) from the edges of all perennial streams, lakes, and other bodies of water. The riparian prescription is designed to manage riparian dependent resources as consistently as possible with the adjacent/or upslope management prescription (usually timber).

The riparian prescription describes basic road design, density, and location criteria for different lands. It also describes the timber management criteria associated with water temperature control, buffering capabilities, debris control and recruitment, stream stability, fish and wildlife habitat needs, and the minimizing of erosion sources. The prescription addresses both on-site and cumulative effects. In general, the timber management criteria are to promote diversity either horizontally with regeneration-type silvicultural prescriptions, or vertically with uneven-aged timber prescriptions and to maintain an old-growth component over time. The intent is to merge the management of the riparian area as much as is feasible with the concurrent management of the adjacent upslope unit.

Riparian zones are protected by limiting the amount and timing of timber harvest occurring in these areas. It was assumed that riparian areas will make up about 13 percent of the suitable timber base. Within the 13 percent only 5.6 percent can be accessed in any decade. Since the suitable base is not known until after the FORPLAN run, these adjustments were made outside of FORPLAN.

5. Diversity

Animal and vegetative diversity is currently very high and well distributed in the Forest. Diversity is provided by maintaining old-growth stands, by harvesting stands of mature trees to replace with young trees, and by allowing vegetative changes caused by fire, insects and disease. A minimum of 10 percent of the Forested area is maintained, at any one time, as old growth. A scheduling constraint applied outside FORPLAN maintains 5 percent of each 10,000 acre unit as old growth. (Units are made up of aggregated compartments.) This constraint is restrictive in the roaded portions of the Forest where past timber harvest has occurred.

6. Adequate Fish and Wildlife Habitat to Maintain Viable Populations

Fisheries: The fish habitat quality MMR for minimum viable populations is an integral part of the water quality (sediment) objectives (see MMR #1) and the riparian area objectives (see MMR #3).

Wildlife: One or more selected indicator species are used to represent wildlife species that have similar biological requirements. Ten species were selected as indicator species. (See planning records, Effects Data.)

Species selected are either impacted by management direction or emphasized in management direction. Endangered, threatened and sensitive species were included. Maintenance of minimum viable populations of wildlife was

incorporated in the design of management prescriptions. As a result, all alternatives and benchmarks maintain at least those minimums.

On elk summer range, a standard and guideline requiring a minimum level of 25 percent of elk potential habitat was defined for all prescriptions. This standard was a limiting factor only on the timber prescriptions. All other prescriptions exceeded 25 percent of elk potential habitat. (See planning records, Effects Data.)

Two wildlife indicator species, goshawk and pileated woodpecker, have optimum habitat in old-growth ecosystems. Old growth is discussed in item five.

7. Consistency with Multiple Use Laws

The Secretary of Agriculture under various laws is directed to administer National Forests for multiple uses such as outdoor recreation, range, timber, watershed, wildlife, fish, and minerals. The Secretary is also directed to develop and administer the renewable surface resources.

The Forest planning and environmental analysis process requires, as a minimum, that processes formerly used to make individual resource decisions must be combined into integrated management decisions.

The riparian zone, diversity, and fish and wildlife MMR's address how multiple use and sustained yield are achieved. The reforestation MMR provides maintenance of a sustained yield of timber without impairment to the productivity of the land.

8. Protecting Threatened and Endangered Species Habitat

The Regional Guide requires the provision of enough habitat for ten gray wolves. Wolf habitat availability was determined for each alternative and benchmark by evaluating prescriptions that provide a reduction in the likelihood of human-wolf encounters. Originally all nontimber prescriptions were assumed to protect wolf habitat, as do the resource timber prescriptions, C2S, C6S and C4. These criteria resulted in providing habitat for at least ten wolves for all benchmarks and all alternatives. On further analysis the nontimber prescriptions, M6 (min level) and M5 (nonforest, not capable and unsuitable for regeneration), do not consistently qualify for gray wolf habitat, because these two prescriptions are applied to noncontiguous land primarily surrounded by timber. When these criteria are applied most of the benchmarks and a few of the alternatives provide habitat that support less than ten wolves. The discussions in Chapter Two on alternative evaluation and Chapter Four quantify the ability of each alternative to provide habitat for gray wolves.

The Forest is presently cooperating in an evaluation of potential suitable grizzly bear habitat.

The riparian management prescription adequately protects the wintering bald eagle habitat and any future nests or roost sites.

9. Providing for Utility and Transportation Rights-of-Way and Corridors

Land disturbing activities such as timber harvest, land clearing, road construction, pipeline trenches and holes for power poles occur when providing rights-of-way. The Forest has determined which lands are exclusion areas, avoidance areas, and potential corridors. Existing major rights-of-way and the potential for future expansion of these rights-of-way have been mapped and considered in the alternatives and benchmarks.

10. Road Construction Standards

Forest development roads provide the access needed to carry out nearly all Forest Service resource management needs. These roads are constructed and maintained to provide safe access and meet resource management objectives. They are categorized into three types: arterial, collector, and local.

Arterial roads comprise the basic access network of the Forest. They provide service to large land areas and usually connect with other public highways to form a network of travel routes. The locations and standards are usually determined by speed and comfort and have double lanes with sustained grades of less than eight percent. Arterial roads can be paved or graveled.

Collector roads are constructed to serve two or more resources and to connect arterial and local roads. They serve smaller land areas than arterial roads and may or may not be operated for constant service depending on the resource objectives. They are graveled roads with either single or double lanes.

Local roads are minimum standard roads. They are generally dead end, and speed is not a consideration. Road alignment follows the natural terrain with grades occasionally exceeding ten percent and are generally native surfaced. Traffic may be restricted.

Mitigating measures to help maintain water quality and reduce damage to fisheries will be applied to newly constructed roads and road maintenance by limiting the amount of sediment entering the streams. Some measures apply to all roads, while others are for specific sections such as within riparian areas or within sediment contributing areas adjacent to active channels. The sediment mitigating guidelines for roads are on file in the Forest planning records. These guidelines were used in the development of management prescriptions.

11. Revegetating Temporary Roads

Even though short temporary roads are sometimes needed to efficiently transport logs, they can affect soil and water resources. The minimum requirement is to re-establish forage or grass cover by seeding. Revegetation is included in the logging practices for prescriptions that harvest timber.

12. Maintaining Air Quality

This requirement was handled outside of FORPLAN. The Regional Guide directs the Forest to work through cooperative agreements with the States to manage

smoke emissions. Scheduling the time and number of prescribed burns is done outside the FORPLAN model and in cooperation with the States of Montana and Idaho.

13. Reforestation

To have a reasonable assurance of regeneration in 5 years, seedlings are planted on most harvested areas. Planting occurs because of the long periods between cone crops, insect (spruce budworm) and disease (blister rust) effects on seed sources and seedlings, grass competition or prevention of natural regeneration, and the need to close harvest openings within 20 years to meet the hydrologic recovery rate established in the soil and water MMR. Planting variables considered were: single species, species mix, stocking rates, and site preparation. The minimum requirement for species is a mix that minimizes plantation losses and the need to replant. Stocking rates are 200 to 600 trees per acre. The rate varies because the drier habitat types can't support full stocking. Site preparation is required in most cases because native planted species cannot grow efficiently if existing vegetation competes for soil nutrients, water, and sunshine. Reforestation is included in the prescriptions with timber harvest as a management practice.

14. Forty-Acre Clearcut Limit

Clearcutting is one silvicultural system used in the Forest for even-aged timber harvest. The Regional Guide established that openings created by even-aged silviculture normally will be 40 acres or less. Costs and practices used are based on clearcuts of 40 acres or less and are included in the management prescriptions.

The constraints applied to meet the minimum management requirements are not compounded. The resource and economic impacts are the same whether the constraints are applied separately and the impacts added, or applied together.

C. BENCHMARK ANALYSIS

Eighteen benchmarks were developed to define the production potentials and economic relationships of the Forest. The efficient schedule of management activities, resource outputs, environmental effects, economic consequences, and land designation to meet the purpose of each benchmark were estimated. Selected benchmarks were used to define upper and lower limits of supply potential for major resources. These limits formed the decision space within which alternative output levels could be formulated.

In addition to determining resource supply potentials, the benchmark analysis was used to define effects on PNV of minimum management requirements, the imposition of nondeclining yield, rotations restricted to substantial culmination of mean annual increment, and the use of sequential bounds.

The procedural direction for conducting the benchmark analysis was provided in a May 31, 1983 letter to the Regions from the Washington Office. The Clearwater National Forest, having a significant timber resource, followed the direction pertaining to Forests that must conduct the entire benchmark analysis.

This section describes the purpose of each benchmark. The major objectives and constraints are displayed in Table B-18.

The four types of benchmarks developed for the Clearwater National Forest are:

1. Maximize Present Net Value Benchmarks - Maximizes the present net value for the Forest and displays the associated resource outputs.
2. Resource Benchmarks - Defines the maximum potentials for timber production, elk, and wilderness.
3. Minimum Level Benchmark - Defines the minimum outputs associated with custodial management of the Forest and the unavoidable costs and benefits of public ownership.
4. Current Management Benchmark - Displays the outputs and effects of continuing current management direction. This benchmark also becomes the "current direction" alternative.

The following procedures apply to all benchmarks:

- Developed using FORPLAN.
- Developed using an objective function of maximizing PNV.
- Not constrained by budget levels.
- Comply with minimum management requirements, except Benchmarks M05, PR2, PC3, PC4, and PM4.
- Timber harvest is precluded on 259,165 acres of existing wilderness, 23,606 acres of recreation river, 1,281 acres Lochsa Research Natural Area, and 224,148 acres of nonforest, noncommercial, and unsuitable lands due to regeneration.
- Timber harvest rotations were constrained to be greater or equal to 95 percent CMAI except Benchmarks PR2, PM4, and PN3.
- A constraint was used to assure that timber inventory in 150 years will equal or exceed the volume that would occur on a regulated Forest.
- Several variations of the present net value and resource benchmarks determined the reduction in PNV and resource trade-offs of meeting specific constraints, objectives, regulations, and policies.

The next two sections following Table B-18 summarize the benchmark runs used to analyze timber policy constraints and explain how resource supply potentials were determined.

Table B-18

Benchmark Objectives and Constraints

			Timber Harvest Constraints							
						Suitable Timber Lands (M acr)	Decade 1 Harvest Floor & Ceiling	Minimum Management Requirements		Other
Run	Objective Function	Purpose	95% CMAI	Ending Inv	Harvest Flow			Soil	Water	Riparian Constr
#1 MO5	Maximize timber 1st decade	Calibrate & validate FORPLAN.	Yes	Yes	NDY	1328 9	No	No	No	No
#2 PR2	Maximize net present value	Evaluate impacts of sequential bounds, harvest floors & ceilings, & MMR's.	No	Yes	Seq Bounds 20% U&L	1300.9	355 MMCF 1062 MMCF	No	No	No
#3 PC3	Maximize net present value	Base run for analyz- ing MMR runs & meas- uring the costs of applying CMAI & NDY constraints.	Yes	Yes	NDY	1303 6	No	No	No	No
#3a PC4	Maximize net present value	Base run for analyz- ing MMR runs & meas- uring the costs of applying CMAI & NDY constraints	Yes	Yes	Seq Bounds 0% L 20% U	1316 8	355 MMCF 1062 MMCF	No	No	No
#4 PM4	Maximize net present value	Show the cost of applying the riparian MMR in the absence of other MMR's.	No	Yes	Seq Bounds 20% U&L	1242 6	355 MMCF 1062 MMCF	No	Yes	No
#4a PN3	Maximize net present value	Show the cost of applying min viable fishery MMR in addi- tion to riparian MMR	No	Yes	Seq. Bounds 20% U&L	1218 3	355 MMCF 1062 MMCF	Yes	Yes	No
#5 PP1	Maximize net present value	Show cost of imposing 95% CMAI in addition to applying sediment & riparian MMR's.	Yes	Yes	Seq Bounds 20% U&L	1216 2	355 MMCF 1062 MMCF	Yes	Yes	No
#6 * PQ1	Maximize net present value	Show the opportunity costs of relaxing CMAI when compared to run PS2	Yes	Yes	Seq Bounds 0% L 20% U	N/A	355 MMCF 1062 MMCF	Yes	Yes	No
#7 PS2	Maximize net present value	Show the opportunity costs of applying the NDSY constraint when compared to run PP1	Yes	Yes	Seq Bounds 0% L 20% U	1248 5	355 MMCF 1062 MMCF	Yes	Yes	No

(Table B-18 cont.)

Benchmark Objectives and Constraints

Timber Harvest Constraints

	Objective		95%	Ending	Harvest	Suitable Timber Lands	Decade 1 Harvest Floor &	Minimum Management Requirements		Other
Run	Function	Purpose	CMAI	Inv	Flow	(M ac r)	Ceiling	Soil & Water	Riparian	Constr
#8	Maximize net	Show the opportunity	No	Yes	Seq	N/A	355 MMCF	Yes	Yes	No
* MT1	present value	costs of relaxing			Bounds		1062 MMCF			
	(market values)	CMAI when compared			0% L					
		to run MU1.			20% U					
#9	Maximize net	Show the difference	Yes	Yes	Seq	1211 2	355 MMCF	Yes	Yes	No
MU1	present value	between Max PNV			Bounds		1062 MMCF			
	(market values)	(assigned values) &			20%					
		Max PNV (mkt values)			U&L					
		when compared to PP1.								
#10	Maximize net	Show the opportunity	Yes	Yes	Seq	N/A	355 MMCF	Yes	Yes	No
* MV1	present value	costs of relaxing			Bounds		1062 MMCF			
	(market values)	CMAI when compared			0% L					
		to run MW1			20% U					
#11	Maximize net	Show the difference	Yes	Yes	Seq	1245 1	355 MMCF	Yes	Yes	No
MW1	present value.	between Max. PNV			Bounds		1062 MMCF			
	(market values)	(assigned values) &			0% L					
		Max PNV (mkt values)			20% U					
		when compared to PS2.								
#12	Maximize net	Specifies the minimum	***** Designate MINLVL Rx for every acre on the Forest *****							
MN1	present value	level of mngmt								
		needed to maintain								
#13	Maximize ELKWTR	Maximize potential	Yes	Yes	Seq	503 7	355 MMCF	Yes	Yes	Yes
** EL2		to produce elk from			Bounds		1062 MMCF			
		winter & summer			0% L					
		range			20% U					
#14	Maximize	Maximize potential	Yes	Yes	Seq	1285 3	355 MMCF	Yes	Yes	No
TIM	timber	to produce timber.			Bounds		1062 MMCF			
					0% L					
					20% U					
#15	Maximize net	Show impacts on	Yes	Yes	Seq	555 1	No Floor	Yes	Yes	Yes
WL2	present value	timber, wildlife,			Bounds		1062 MMCF			
		etc , if all rdls			0% L					
		areas were designated			20% U					
		wilderness								
#16	Maximize net	Estimate impacts &	Yes	Yes	Seq	1041 0	Equal to	Yes	Yes	Yes
AA6	present value	effects of current			Bounds		369 MMCF			
		management			0% L					
					20% U					

* FORPLAN runs were required for timber constraint analysis but were not made
(See the letter titled AMS FORPLAN Runs dated April 19, 1984)

** A minimum number of 31,000 elk was set for the elk summer range

1. Benchmark Runs Used to Examine MMR, Timber Harvest, and Timber Policy Constraints

a. Timber Flow Constraints

Three types of harvest flows constraints were applied in the benchmark runs. These were: nondeclining yield with no upper bound on harvest in the next decade; nondeclining yield as defined by a 0 percent lower bound and 20 percent upper bound; and departure harvest flows as defined by a 20 percent lower and upper bound.

Nondeclining yield limits the per decade harvests to levels greater-than-or-equal-to the preceding decade level. This constraint was used to ensure a constant even-flow of timber harvest throughout the planning horizon.

Originally the harvest was allowed only to increase in the next decade to maximize present net value. This produced increases in harvest levels of over 600 percent from the previous decade. In later benchmark runs, an upper bound of 20 percent was applied on the assumption that adding one average sized sawmill per decade within the Clearwater National Forest zone of influence was reasonable.

To test the effects on PNV of applying nondeclining yield, a departure run was made on many of the benchmarks. This was defined on a sequential upper and lower bound of 20 percent. This constrained harvest levels to + or - 20 percent of the previous decade harvest. The rationale for 20 percent was the same as explained for nondeclining yields.

A floor of 160 MMBF/yr and a ceiling of 478 MMBF/yr was applied to all benchmark runs but MO5, PC3, MN1, and WL2. Floor and ceiling constraints were used to establish a reasonable parameter on first decade timber harvests which would not invoke substantial change in local consumptive patterns. Normally this limit is imposed on the first decade only, allowing the objective functions and other constraints to control the solution beyond the first decade.

Floors and ceilings were calculated considering timber outputs which would not create a "rapid change" in the local economy. Floors were defined as 6 percent below current harvest level, and ceilings were based on the manufacturing capability for the past five years of sawmills within the Clearwater's marketing area. Applying the floor and ceiling constraints did not constrain or effect the solution of the FORPLAN model.

NFMA (36 CFR 219.16 [2] {iii}) directs the Forest Service to analyze timber rotation lengths based on the time required for stands to reach the culmination of net growth. Timber rotation lengths based on 95 percent of the culmination of mean annual increment (CMAI) for existing and regenerated stands were used. CMAI assures that all stands scheduled for harvest have reached this level. CMAI was used to constrain the FORPLAN model to when timber harvests could actually occur.

An ending inventory constraint was applied to all runs to ensure timber would still be available after 15 decades.

b. FORPLAN Runs

Following are descriptions of the minimum management requirements (MMR's), timber harvest and timber policy related FORPLAN runs made during the benchmark analysis process, including the purpose of each run, the results, and conclusions.

RUN 1

Identification: MO5

Objective Function: Maximize timber in the first decade.

Constraints:

1. Nondeclining yield.
2. Rotations based on 95 percent CMAI.
3. Ending inventory.

Purpose: Calibrate and validate FORPLAN model. Verify timber information, land base, and other resource outputs and coefficients.

Results:

1. The scheduled output for first decade elk winter range numbers were low. This was corrected to be about 12,000 elk.
2. New sediment and local road yield tables were verified. Sediment yields were higher in decades 1 to 4 than 5 to 15. Local road densities averaged about 6 miles/sq. mile in decades 1 to 4 and between 1 and 2 miles/sq. mile in decades 5 to 15. Local road miles included reconstruction.
3. Timber volumes averaged over 600 MMBF/yr. for all decades.
4. The tentatively suitable timber base was 1,328.9 M acres.
5. PNV for this benchmark is \$1111 MM.

Conclusions: The FORPLAN model is functioning properly to proceed with the benchmark analysis.

RUN 2

Identification: PR2

Objective Function: Maximize present net value.

Constraints:

1. Sequential upper and lower bounds of 20 percent.
2. Harvest ceiling of 478 MMBF/yr. (mill capacity) and a harvest floor of 160 MMBF/yr. (current cut) in all 15 decades.
3. Ending inventory.
4. Rotations based on utilization standards.

Purpose: Evaluate the impacts of sequential bounds, harvest floors and ceilings, and minimum management requirements.

Results:

1. First decade harvest volume of 367 MMBF/yr. is greater than the floor and less than the ceiling. The floor of 160 MMBF/yr. is not approached in any decade.
2. The model chose to designate 28,000 acres to minimum level.
3. PNV for this benchmark is \$1592 MM.
4. Long-term sustained yield (LTSY) is 1377 MMCF/decade.

Conclusions:

1. Harvest floors or ceilings are not binding in the first decade.

2. No additional runs will be needed to determine the appropriateness of the harvest floor and/or ceiling.

3. The 28,000 acres designated to minimum level were not needed to optimize the maximum PNV objective and are therefore unsuitable due to economics in this run.

RUN 3

Identification: PC3

Objective Function: Maximize present net value.

Constraints:

1. Nondeclining yield.
2. Rotations based on 95 percent CMAI.
3. Ending inventory.

Purpose:

1. Forms a base run to be used in comparing and analyzing later runs that have minimum management requirements as constraints.
2. Shows the differences that result when NDY is used as a constraint without a sequential upper and lower bounds constraint.
3. Shows the differences that occur when a maximum PNV (assigned values) objective function is used in place of a maximum timber objective function (compared to run #1).

Results

1. The PNV for this benchmark is \$1600 MM.
2. The LTSY increased from 1377 MMBF in run #2 to 1394 in this run.
3. The land designations were essentially the same as in run #2.
4. The first decade harvest volume was surprisingly low (approx. 111 MMBF) and increased sharply to the sustained yield level of 600+ MMBF in the 2nd decade.

Conclusions:

1. The low first decade harvest volume is due to a higher contribution to PNV of the sawtimber volume in decades two-to-five than in decade one. This is caused by increased yield projections in decades two-to-five and in real price increases assumed in the economic tables.
2. When the NDY constraint is used without an upper sequential bonds, the second decade harvest increases by over 500 percent from the first decade.
3. This run has the highest PNV of all the benchmarks.

RUN 3a

Identification: PC4

Objective Function: Maximize present net value.

Constraints:

1. Nondeclining yield.
2. Sequential lower bound of 0 percent and upper bound of 20 percent.
3. Ceiling of 478 MMBF and floor of 160 MMBF.
4. Rotation based on 95 percent CMAI.
5. Ending Inventory.

Purpose: Used as a base run from which to compare and analyze MMR's and measure effects on PNV of applying CMAI and NDY constraints when compared to run #2.

Results:

1. The PNV for this benchmark is \$1566 MM.

2. The model designated 11,653 acres to minimum level compared to 25,307 acres in run #2.

3. The long-term sustained yield (LTSY) is 1394 MMCF as compared to 1377 in run #2.

4. The first decade harvest volume increased from 111 MMBF/yr in run #3 to 385 MMBF/yr in this run.

Conclusions:

1. The effect of applying NDY with a 20 percent upper bound on the harvest schedule is a shift of more volume harvested in the first decade at a slight cost in PNV when compared to run #3.

2. Floors and ceiling constraints do not effect the solution of FORPLAN.

3. When compared to run #2 the reduction in PNV of applying NDY is estimated as \$26 MM.

RUN 4

* Identification: PM4

Objective Function: Maximize present net value.

Constraints:

1. Sequential upper and lower bounds of 20 percent.

2. First decade harvest floor and ceiling.

3. Ending inventory.

4. Rotations based on utilization standards.

5. Riparian and minimum level are the only prescription choices on riparian analysis areas.

Purpose: Shows the effects on PNV of applying the riparian MMR given the absence of any other MMR's and an objective function of maximum PNV (assigned values) with the presence of sequential upper and lower bounds, floors, ceilings and an ending inventory constraint.

Results:

1. PNV is \$1419 MM, a drop of 11 percent.

2. LTSY dropped from 1377 MMCF/yr in run #2 to 1308 in this run.

3. First decade harvest volume dropped from 367 MMBF in run #2 to 317 in this run.

4. The model designated 85,868 acres to minimum level, of which 25,000 acres are within riparian analysis areas.

5. Sediment production dropped from 84 M tons annually in run #2 to 57 tons in this run.

Conclusions: The results of this run when compared to run #2 show the effects of applying the riparian MMR given only those constraints and objectives associated with this run. The riparian MMR is the most constraining of the MMR's; however, when applied, it also contributes to achieving the minimum viable fishery MMR and the requirement for diversity and habitat for old-growth dependent species.

RUN 4a

Identification: PN3

Objective Function: Maximize present net value.

Constraints: The same constraints were used in this run as in run #4 with the addition of a sediment constraint which would result in a minimum viable fishery habitat condition Forestwide. This is the fishery and protection of soil and water quality MMR.

Purpose: Shows the effects on PNV of applying the minimum viable fisheries and riparian MMR's given an objective of maximizing PNV and the presence of sequential upper and lower bounds, floors, ceilings, and an ending inventory constraint.

Results:

1. PNV is \$1340 MM which is a drop of 6 percent when compared to run #4.
2. The model designated 109,524 acres to minimum level as compared to 85,868 acres in run 4.
3. The model designated 130,596 acres to a wildlife-timber prescription that provides for timber harvest but produces less sediment than intensive timber prescriptions.
4. Long-term sustained yield (LTSY) dropped from 1308 MMCF/decade in run #4 to 1256 in this run.
5. The first decade harvest volume dropped from 317 to 295 MMBF/yr.

Conclusions:

1. Applying the riparian MMR in combination with the minimum viable fisheries MMR causes a reduction in PNV of about 16 percent as compared to run #2.
2. The drop in first decade harvest volume attributed to MMR's is 72 MMBF/yr., given the constraint set used in run #s 2 and 4a.
3. The switch in designation from timber to wildlife/timber on 125,004 acres is a result of MMR's.
4. About 25,000 acres of the minimum level designation is caused by the harvest schedule constraint in the riparian prescription. The remainder of the 109,525 minimum level acres are not suitable in this run due to maximizing present net value. The tentatively suitable land designated to MINLVL is generally land with low PNV's (i.e. low productivity, steep breaklands, and young existing condition classes).

RUN 5

Identification: PP1

Objective Function: Maximize present net value.

Constraints:

1. Sequential upper and lower bounds.
2. Harvest floor and ceiling.
3. Ending inventory.
4. 95 percent CMAI.
5. Riparian and minimum viable fisheries MMR's.

Purpose: Shows the effects on PNV of imposing 95 percent CMAI to run #4a.

Results:

1. PNV is \$1317 MM which is a drop of 1.7 percent when compared to run #4a.
2. The model designated 111,662 acres to minimum level, slightly more than run #4a.
3. LTSY is 1252 MMCF/decade a drop of .3 percent when compared to run #4a.
4. First decade harvest volume drops 9 MMBF to 286 MMBF/yr.
5. Remaining land designations and resource outputs vary only slightly from run #4a.

Conclusions: Meeting the requirement of delaying harvest until substantial culmination of mean annual increment is reached does create a cost in PNV and first decade harvest volume reduction, but the cost is minor given the constraints used in this run.

RUN 6 (Not used. See below.)

Identification: PQ1

Objective Function: Maximize present net value.

Constraints:

1. Nondeclining yield.
2. Rotations based on utilization standards.
3. Minimum management requirements.
4. Ending inventory.

Purpose: This run was to have functioned as a base from which to measure the effects on PNV of rotations restricted to 95 percent CMAI given the objective of maximum PNV and the presence of NDY, MMR's, and ending inventory constraint. It was also to have served as a base run to show the effects on PNV of NDY when compared to run #4a.

Note: This run was not made, because the results would be essentially the same as run #7. The effect of rotations restricted to 95 percent CMAI and NDY yield were sufficiently tested in run #7 and it was obvious that this run would only repeat information already available. (See planning records: Letter to RO, April 19, 1984: "AMS FORPLAN Runs.")

RUN 7

Identification: PS2

Objective Function: Maximize present net value.

Constraints:

1. 0 percent lower bound and 20 percent upper bound. (NDY)
2. Harvest floor and ceiling.
3. Ending inventory.
4. Rotation based on 95 percent CMAI.
5. Minimum management requirements.

Purpose: Use as a base run to show the effects on PNV of the MMR's when compared to run 3a, and the effects on PNV of NDY in concert with 95 percent CMAI when compared to run #4a.

Results:

1. The PNV is \$1320 MM. This is a drop of 16 percent when compared to run #3a.
2. The long-term sustained yield (LTSY) is 1299 MMCF.
3. 78,919 acres were designated to minimum level.
4. First decade harvest is nearly identical to run #4a.

Conclusions:

1. The designation of 78,287 acres to minimum level, which is about 31,000 acres less than in run #4a, indicates lands with a low PNV were needed in the suitable timber base to meet the NDY.
2. The PNV drop of 16 percent, when compared to run #3a, is attributable to the combination of MMR's.

RUN 8 (Not used. See below.)

Identification: MT1

Objective Function: Maximize present net value (market values).

Constraints: Same as run #4a except with market values only.

Purpose:

1. Use as a base to show the effects on PNV of restricting rotations to 95 percent CMAI using market values only when compared to run #9.
2. Show the differences that result from maximum PNV (assigned values) and maximum PNV (market values) when compared to run #4a.

Note: This run was not made because information gained from previous runs show that restricting rotations to CMAI have little or no effect on PNV, and this would not likely change using market values only. Purpose #2 will be done in run #9. (See planning records: Letter to RO, April 19,1984, "AMS FORPLAN Runs.")

RUN 9

Identification: MU1

Objective Function: Maximize present net value (market values).

Constraints: The same constraint set as run #5 (PP1) was used, except with market values only.

Purpose: Shows the differences that result from maximum PNV (assigned values) and maximum PNV (market values), when compared to run #5.

Results:

1. PNV is \$1192 MM which is a drop of 9 percent when compared to run #5.
2. The land designations are very much the same as in run #5.
3. LTSY dropped slightly (5 MMCF) compared to run #5.
4. First decade harvest is about the same as in run #5.

Conclusions:

1. The 9 percent drop in PNV shows the effect on PNV of valuing only market goods.
2. Valuing nonmarket goods in the FORPLAN model has very little effect on harvest scheduling, LTSY, and land designations, using the same criteria in this run and run #5. The only (significant) effect noted was the acres designated to prescriptions winter and WTR-TM decreased a total of 1,735 acres when compared to run #5.

RUN 10 (Not used. See below.)

Identification: MV1

Objective Function: Maximize present net value (market values).

Constraints: The same constraints as run #6, except with market values only.

Purpose: Shows the differences that result from maximum PNV (assigned values) and maximum PNV (market values), when compared to run #6.

Note: This run was not used because runs #9 and #11 provide the needed information. (See planning record: Letter to RO 1920, April 19,1984, "AMS FORPLAN Runs.")

RUN 11

Identification: MW1

Objective Function: Maximize Present Net Value (market values).

Constraints: The same constraints as run #7, except with market values only.

Purpose:

1. Shows the effect on PNV of NDY given an objective of maximum PNV (market values) and the presence of MMR's, ending inventory constraint and rotations restricted to 95 percent of CMAI, when compared to run #9.

2. Shows the differences that result from maximum PNV (market values) and maximum PNV (assigned values), when compared to run #7.

Results:

1. PNV is \$1173 MM which is a drop of 1.7 percent when compared to run #9, and 11 percent when compared to run #7.

2. Long-term sustained yield (LTSY) increased 48 MMCF/decade compared to run #9, and dropped 4 MMCF/decade compared to run #7.

3. Designations did not change significantly from run #7, but 33,500 fewer acres were designated to minimum level in this run than in run #9.

4. First decade harvest volume is about the same as in run #7, but 5 MMBF/yr. more than in run #9.

Conclusions:

1. The effect on PNV of NDY are similar when using market values and when all values are assigned. In both cases the costs are relatively low. The same conclusion holds true when the effects of NDY were tested using different constraint sets. However, one significant effect or cost of imposing the NDY constraint that has shown up consistently is a shift in the amount of minimum level land designation. More land (about 33,000 acres) is designated to minimum level in runs where NDY is not imposed than when it is. This shows that to meet the NDY constraint, more land (considered inefficient in other runs) is needed in the suitable base.

2. About 11 percent of the PNV in FORPLAN consists of nonmarket values in runs where all values are assigned.

**c. Conclusions and Effects on PNV from Timber
Constraint and MMR Analysis**

In this section, the trade-offs of timber harvest floors and ceilings, timber policy constraints, minimum management requirements (MMR's), and market vs. assigned values will be analyzed.

**(1) Effects on PNV of Timber Harvest
Floors and Ceilings**

The harvest floors and ceilings were not constraining in any of the benchmark runs; therefore, the effect on PNV was 0.

**(2) Effects on PNV of Timber
Policy Constraints**

An upper bound of 20 percent is a necessary constraint to prevent wide fluctuations in harvest volumes. When only nondeclining yield is compared to nondeclining yield with a sequential upper bound of 20 percent, more volume is harvested in the first decade at a cost in PNV. With only a nondeclining yield constraint, a very low (111 MMBF/yr) first decade harvest is followed by an unrealistic high (600+ MMBF/yr) second decade harvest.

For departure runs an upper and lower bound of 20 percent were applied for the same reason. This also resulted in a drop of PNV when compared to nondeclining

yield only.

Runs compared: Run #3 (PC3) PNV = \$1600 MM
Run #3a (PC4) PNV = \$1566 MM
Reduction in PNV: \$34 MM.

PNV is reduced by 2 percent by applying an upper bound of 20 percent on nondeclining yield.

Runs compared: Run #3 (PC3) PNV = \$1600 MM
Run #2 (PR2) PNV = \$1592 MM
Reduction in PNV: \$8 MM.

PNV is reduced by .5 percent by applying an upper and lower bound of 20 percent.

Meeting the requirement of nondeclining yield with an upper bound of 20 percent versus allowing the yield to decline by 20 percent results in a drop in PNV of about 1.6 percent. The cost occurs as more acreage (about 33,500 acres), that was designated to minimum level when NDY was not a constraint, was needed to meet the objective when constrained by NDY.

Runs compared: Run #9 (MU1) PNV = \$1192 MM
Run #11 (MW1) PNV = \$1173 MM
Reduction in PNV: \$19 MM.

Meeting the requirement of delaying harvest until substantial CMAI is reached, does create a cost by reducing PNV and harvest volume in the first decade. But the cost was considered minor and therefore runs #6, #8, and #10 were not made. These runs only vary from runs #7, #9 and #11 in that CMAI is relaxed two decades.

Runs compared: Run #4a (PN3) PNV = \$1340 MM
Run #5 (PP1) PNV = \$1317 MM
Reduction in PNV: \$23 MM.

This is a reduction in PNV of 1.7 percent as a result of applying 95 percent of CMAI as a constraint.

(3) Minimum Management Requirements (MMR's)

The riparian MMR lowers PNV by 11 percent when run without any other MMR's and the objective of maximum PNV. This is a significant cost caused by not allowing more than 5.6 percent of the riparian area to be accessed in any decade. When the riparian MMR is applied, additional acreage is designated to minimum level (about 25,000 acres). Part of the reduction in PNV is caused by the model not being able to access all of the riparian analysis areas in 15 decades. The remaining reduction in PNV is due to riparian analysis areas having negative PNV's before they can be accessed. Thus these areas are designated to minimum level (about 30,000 acres).

Part of the reduction in PNV of the riparian MMR is the cost of improving fishery habitat condition by reducing sediment output from the riparian prescription. A part of the cost is also of meeting the requirement for diversity and habitat for old-growth dependent species.

Runs compared: Run #2 (PR2) PNV = \$1592 MM
Run #4 (PM4) PNV = \$1419 MM
Reduction in PNV: \$173 MM.

The minimum viable fish habitat MMR causes a reduction in PNV of 6 percent. This reduction in PNV is partly due to the designation of wildlife/timber prescriptions over intensive timber. This change in designation occurs because wildlife/timber prescriptions produce less sediment. The wildlife/timber prescriptions assume a higher percentage of logging will occur with skyline and aerial systems. These prescriptions require fewer roads and therefore produce less sediment.

Run compared: Run #4 (PM4) PNV = \$1419 MM
Run #4a (PN3) PNV = \$1340 MM
Reduction in PNV: \$79 MM.

The riparian and minimum viable fisheries MMR's when applied together cause a reduction in PNV of about 16 percent.

Runs compared: Run #3a (PC4) PNV = \$1566 MM
Run #7 (PS2) PNV = \$1320 MM
Reduction in PNV: \$246 MM.

(4) Market Vs Assigned Values

When only market values are used in place of assigning all values, a drop in PNV results. However, the harvest schedule, long-term sustained yield, and land designations are very much the same as when all values are assigned. This is caused by the fact that the majority of the nonmarket values, i.e., recreational use, are applied outside of the FORPLAN model.

Run compared: Run #5 (PP1) PNV = \$1317 MM
Run #9 (MU1) PNV = \$1192 MM
Reduction in PNV: \$125 MM.

PNV drops by 9 percent when only market values are applied along with a sequential upper and lower bound of 20 percent.

Run compared: Run #7 (PS2) PNV = \$1320 MM
Run #11 (MW1) PNV = \$1173 MM
Reduction in PNV: \$147 MM.

PNV drops by 11 percent when market values only are applied along with nondeclining yield with a 20 percent upper bound.

2. Benchmark Determination Of Resource Supply Potentials

a. FORPLAN Runs

Following are descriptions of the FORPLAN runs made to determine the benchmark supply potential. The purpose of each run, the results, and conclusions are discussed.

RUN 12

Identification: MN1

Objective Function: Maximize present net value.

Constraints:

1. Forced designation of the MINLVL prescription to every acre.

Purpose: Defines the outputs associated with custodial management and the

unavoidable costs and benefits of public ownership.

Results:

1. The PNV is \$288 MM or about 78 percent lower than run #7.
2. The unavoidable costs are about \$2.5 MM annually or 20 percent of the 1980 budget.
3. The elk winter range potential decreases from 11,628 annually in the first decade to 2,759 in decade 15.
4. No timber is harvested in this benchmark.
5. Potential elk summer range stays a constant 18,177 per year for all decades.
6. No sediment (above natural), local roads, collector roads, or AUM's are produced.
7. Capacity for primitive and semiprimitive recreation maintains a high level of 3,319,291 RVD's/yr for all 15 decades.

Conclusions:

1. This run defines the lowest potential elk winter range and the minimum cost and PNV.
2. The primitive and semiprimitive visitor day outputs are the highest that can be produced in the Forest.

RUN 13

Identification: EL2

Objective Function: Maximize potential elk winter range for all 15 decades.

Constraints:

1. Sequential lower bound of 0 percent (NDY) and upper bound of 20 percent.
2. Harvest floor of 160 MMBF/yr and ceiling of 478 MMBF/yr.
3. Ending inventory.
4. 95 percent CMAI.
5. Riparian and minimum viable fishery MMR's.
6. Potential elk summer range greater than or equal to 31,000 elk/yr. for all 15 decades.

Purpose: Defines the maximum potential to produce elk from winter and summer range, subject to the above constraints.

Results:

1. The PNV is \$648 MM, 51 percent lower than run #7.
2. The average potential from winter range is 22,836 elk annually. This is achieved by burning 11 percent of the winter range and designating the remaining winter range to timber management.
3. The potential summer range is 31,000 elk annually for all 15 decades. The constraint level of 31,000 elk on summer range was determined by a separate run with a goal of 40,000 potential elk on summer range. The 31,000 potential was as close as the run could get to the goal. The 31,000 elk on summer range is achieved by designating most of the roadless summer to nontimber prescriptions.
4. Elk numbers on winter range average only 13,460 elk for the first decade.
5. First decade timber harvest is about 175 MMBF/yr.

Conclusions:

1. Potential winter range is the limiting factor on elk production, given the constraints of this run.
2. Over the planning horizon, cutting timber on the winter range will produce more elk than burning. Burning produces more elk in decade one, but by

decades three and four, forage production that results from timber cutting in decade one will produce three times as many elk as burning.

3. In the early decades, potential elk on winter range could be increased with a slight decrease in potential winter range (22,020 elk), if an objective function of maximizing potential winter for the first five decades was applied. Elk production will average 30,325 elk in decades one to five. This can be accomplished by burning 28 percent of the winter range and designating the remainder to timber management.

4. Very little timber harvest is occurring on the roadless summer range to achieve the 31,000 potential elk. This is based on the philosophy of the less disturbance the elk receive, the more elk will be produced.

RUN 14

Identification: TIM

Objective Function: Maximize timber for 15 decades.

Constraints:

1. Sequential lower bound of 0 percent (NDY) and upper bound of 20 percent.
2. Harvest floor of 160 MMBF/yr and ceiling of 478 MMBF/yr.
3. Ending inventory.
4. Rotations based on 95 percent CMAI.
5. Riparian and minimum viable fishery MMR's.

Purpose: Defines the maximum potential for timber given the above constraints and objectives.

Results:

1. PNV is \$1196 MM, 9 percent lower than run #7.
2. First decade harvest volume is 326 MMBF/yr and an increase of 30 MMBF/yr from run #7.
3. Long-term sustained yield (LTSY) is 1325 MMCF/decade, an increase of 28 MMCF from run #7.

Conclusions:

1. The drop in PNV is a result of maximizing timber rather than PNV, which indicates some low value timberlands enter the solution when using the maximum timber objective function.
2. The harvest schedule for this run is the highest possible timber output from the Forest, given the constraint set and objective function used.

RUN 15

Identification: WL2

Objective Function: Maximize present net value with maximum wilderness.

Constraints:

1. Sequential lower bounds of 0 percent (NDY) and upper bounds of 20 percent.
2. Ceiling of 478 MMBF/yr.
3. Ending inventory.
4. Rotations based on 95 percent CMAI.
5. Riparian MMR.
6. Low fishable sediment constraint on all Districts but Palouse. Minimum viable sediment constraint on Palouse District except for Elk Creek which is low fishable.
7. Designate all roadless areas to wilderness management.

Purpose: Shows the outputs and effects of having the maximum amount of land designated to wilderness while managing the watersheds for a low fishable condition on the developed portions of the Forest.

Results:

1. PNV is \$811 MM, 39 percent lower than run #7.
2. LTSY is 592 MMBF/decade.
3. Total wilderness designated is 1,096,635 acres.
4. The first decade harvest volume is 147 MMBF/yr from 555,000 acres of suitable land.

Conclusions:

1. The model is able to maintain near current harvest levels from only the developed portions of the Forest by trading off fishery values. A more realistic fishery objective of providing a moderate to high habitat condition will be used when this run is formed into an alternative.

RUN 16

Identification: AA6

Objective Function: Maximize present net value under current management.

Constraints:

1. Sequential lower bound of 0 percent (NDY) and upper bound of 20 percent.
2. First decade harvest volume of 170 MMBF/yr.
3. Ending inventory.
4. Rotations based on 95 percent CMAI.
5. Riparian MMR.
6. Moderate fishable all Districts except D2 minimum viable and D1 roaded low fish.
7. Produce 15,000 elk minimum winter range for 15 decades.
8. Defer harvest in the Elk Summit area for the first decade.
9. Various prescription constraints to mirror current management direction.

Purpose: Use as a base to compare alternatives and also as a measure of effects under a "current direction" alternative.

Results:

1. PNV is \$1094 MM, a 17 percent drop when compared to run #7 which mirrors the current direction.
2. The model designated 56,270 acres to minimum level and still was able to meet the objectives and constraints of the run.
3. The harvest volumes are below RPA about 40 MMBF/yr until the 5th decade when the RPA level is reached.

Conclusions:

1. This run, constrained to mirror current management, was feasible and can be considered to represent the effects and outputs under "current direction."
2. The minimum level designation consists, in part, of lands uneconomical for timber production and partly of lands that required a "do nothing" designation to meet the constraints, particularly the sediment constraint.

This concludes the benchmark analysis as structured to determine maximum and minimum resource levels for the major resources. Table B-19 displays the outputs and effects of these runs. Table B-20 displays the constraints of all runs; Table B-21 displays the designations of acres; and Table B-23 shows the present value benefits and present value costs by resource.

Table B-19

Benchmark Analysis

		RUN #	1	2	3	3a	4	4a	5	7
		RUN ID	MO5	PR2	PC3	PC4	PM4	PN3	PP1	PS2
OUTPUTS and EFFECTS		Ave	Ann							
Present Net Value	MMS		1110 7	1592 5	1600 2	1566 2	1419 2	1340 3	1317 4	1320 1
LTSY	MMCF		135 5	137 7	139 4	139 7	130 8	125 6	125 2	129 9
Suitable Timberland	ACRE		1329	1301	1304	1317	1242	1218	1210	1249
Nonsuitable Land	ACRE		284	312	309	296	371	395	403	364
Nonproductive Land	ACRE		224	224	224	224	224	224	224	224
Timber Harvest Vol	MMBF									
Decade 1			624	367	111	385	318	295	285	296
(Excluding Non-			623	425	633	445	363	339	328	342
Interchange-			593	505	621	529	437	407	392	407
able Volume)			551	709	595	607	614	573	548	553
Sediment Produced	M TONS									
Decade 1			324	84	14	91	58	39	38	39
2			181	60	101	63	80	47	46	47
3			199	87	120	91	72	55	52	56
5			54	103	96	91	88	52	51	39
Elk Habitat										
Potential Winter	M ELK									
Decade 1			12	13	12	13	13	13	13	15
2			26	27	21	27	24	28	27	30
3			34	33	29	34	32	32	32	35
5			21	17	23	18	18	16	19	23
Elk Habitat										
Potential Summer	M ELK									
Decade 1			21	21	21	21	21	21	21	21
2			18	20	20	19	20	20	20	20
3			17	19	19	18	19	18	18	18
5			13	14	14	14	15	15	15	15
Capacity for										
Semiprimitive										
Recreation	M RVD									
Decade 1			310	316	330	316	318	314	316	318
2			246	280	284	267	296	289	289	284
3			225	269	262	254	281	253	254	243
5			152	168	167	150	179	167	190	175
Range Forage										
Existing	M AUM									
Decade 1			16	16	16	16	16	16	16	16
2			17	17	17	17	17	17	17	17
3			17	17	17	17	17	17	17	17
5			20	20	20	20	20	20	20	20

(Table B-19 cont)

Benchmark Analysis

		RUN #	9	11	12	13	14	15	16
		RUN ID	MU1	MW1	MIN	EL2	TIM	WL2	AA6
OUTPUTS and EFFECTS Ave. Ann.									
Present Net Value	MM\$		1192 5	1172.7	287 7	648	1196	810 9	1093 8
LTSY	MMCF		124 7	129.4	0	485	1385	592	103
Suitable Timberland	ACRE		1211	1245	0	504	1285	555	1041
Nonsuitable Land	ACRE		402	368	1613	1109	328	1058	626
Nonproductive Land	ACRE		224	224	224	224	224	224	224
Timber Harvest VOL	MMBF								
Decade 1			286	290	0	175	326	147	170
(Excluding Non- 2			329	335	0	171	379	167	206
interchangeable 3			391	398	0	169	445	205	239
Volume) 5			547	551	0	179	549	261	349
Sediment Produced	M TONS								
Decade 1			39	40	0	22	46	12	18
2			46	46	0	17	46	12	26
3			51	53	0	20	53	21	31
5			51	35	0	9	53	17	25
Elk Habitat									
Potential Winter	M ELK								
Decade 1			13	13	12	15	12	14	17
2			21	19	10	14	19	18	31
3			26	24	9	11	25	20	30
5			20	23	4	41	24	11	17
Elk Habitat									
Potential Summer	M ELK								
Decade 1			20	21	18	31	20	18	21
2			19	19	18	31	19	18	20
3			18	18	18	31	18	18	20
5			15	15	18	31	14	17	19
Capacity for									
Semiprimitive									
Recreation	M RVD								
Decade 1			314	315	332	338	304	0	264
2			290	277	332	335	274	0	241
3			255	243	332	328	245	0	227
5			190	175	332	318	155	0	191
Range Forage									
Existing	M AUM								
Decade 1			16	16	0	12	16	13	16
2			17	17	0	13	17	14	17
3			17	17	0	13	17	14	17
5			20	20	0	16	20	17	20

Table B-20 (Part I)

Summary of Major Modeling Constraints and
Opportunity Costs Explored in the Benchmarks

1 Timber Harvest, Timber Policy and Minimum Management Requirements

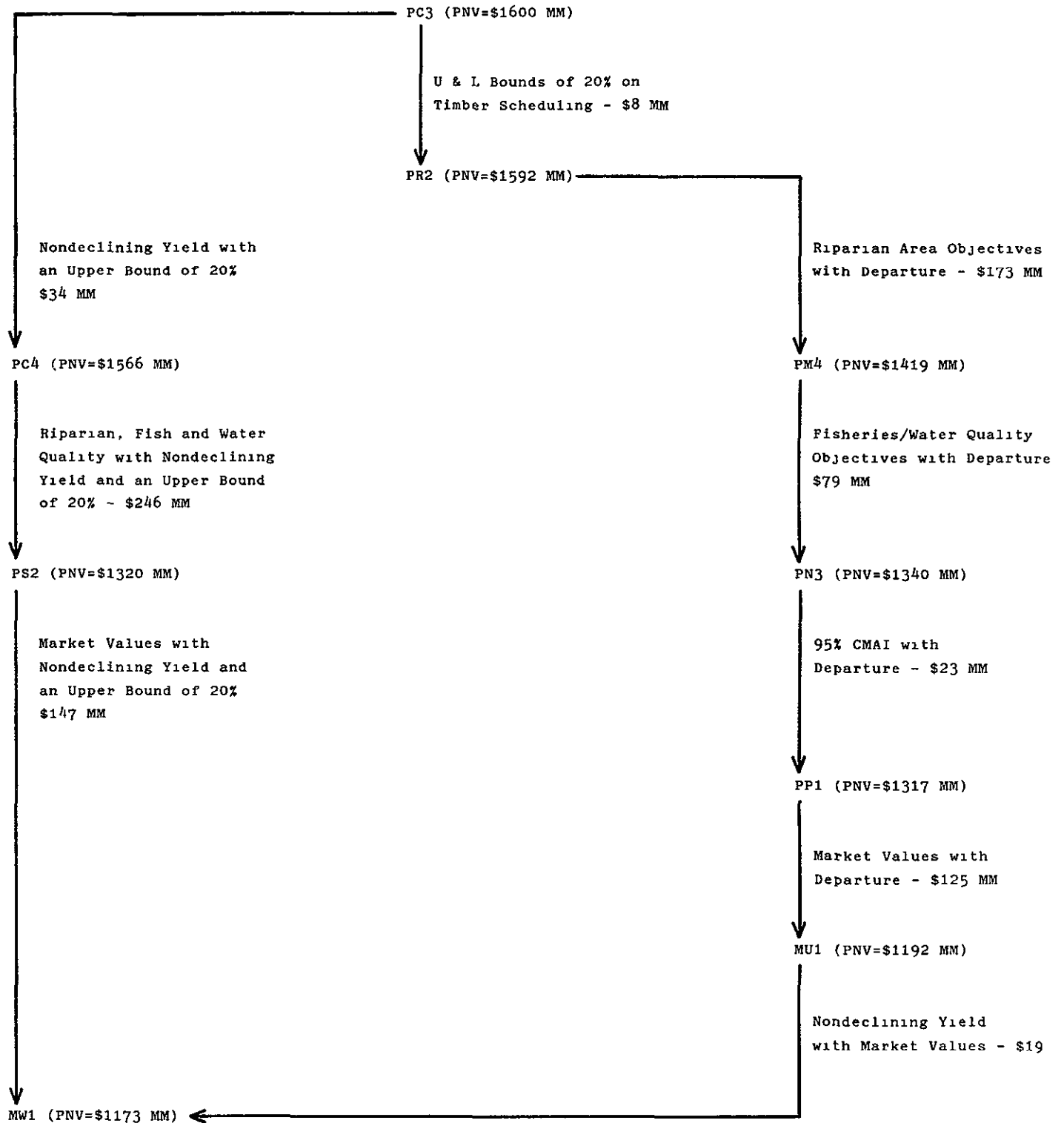


Table B-20 (Part II)

Summary of Major Modeling Constraints and
Opportunity Costs Explored in the Benchmarks

2 Maximum Resource Outputs

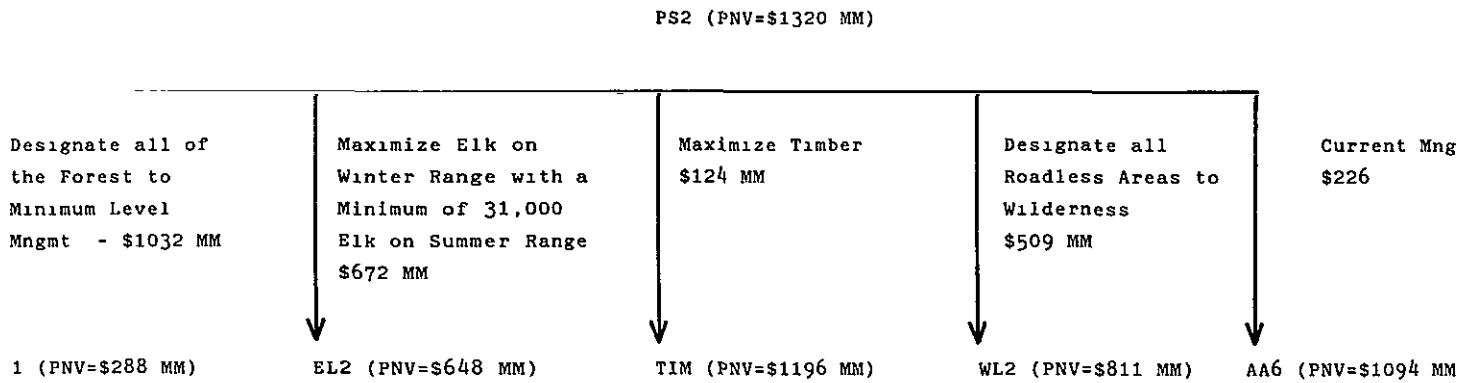


Table B-21

Benchmark Runs

Land Designations in Thousands of Acres

Benchmark Run # I D	Min Level	Wilderness Rec River RNA	Non- Productive	Timber	Wildlife/ Timber	Visuals/ Timber	Riparian/ Timber	Wildlife/ Roadless	Winter Browse	Recreat/ Roadless
1 M05	0	283 9	224 1	1296 6	27 2	5 4	0	0	0	0
2 PR2	28 0	283 9	224 1	1289 1	6 2	5 4	0	0	0	0
3 PC3	25 3	283 9	224 1	1294 1	3 7	5 7	0	0	0	0
3a PC4	11 6	283 9	224 1	1305 0	6 2	5 4	0	0	0	0
4 PM4	85 8	283 9	224 1	1125 6	5 5	5 4	105 9	0	0	0
4a PN3	109 5	283 9	224 1	976 1	130 5	5 5	106 3	0	1 0	0
5 PP1	111 6	283 9	224 1	961 0	142 6	5 9	106 3	0	0	0
7 PS2	78 3	283 4	224 1	1029 7	99 0	2 9	116 9	0	0	0
9 MU1	117 3	283 9	224 1	964 0	135 7	6 1	105 4	0	0	0
11 MW1	83 8	283 9	224 1	1026 2	100 6	5 7	112 2	0	0	0
12 MIN	1837 1	0	0	0	0	0	0	0	0	0
13 EL2	247 2	283 9	224 1	111 6	336 4	2 8	52 6	312 0	16 7	249 11
14 TIM	43 6	283 9	224 1	960 1	191 5	0	133 5	0	0	0
15 WL2	37 4	1213 4	28 3	413 6	84 8	0 5	56 0	0	2 7	0
16 AA1	56 3	382 4	129 3	759 4	82 7	92 0	106 5	46 67	41 8	46 1

Table B-22.

Discounted Costs, Benefits, and Present Net Value

Benchmark	<u>Discounted Costs</u>		<u>Discounted Benefits</u>		<u>Present Net Value</u>	
	Million \$	Change	Million \$	Change	Million \$	Change
PC3	754	>+42	2354	>+35	1600	>-8
PR2	796	>+18	2389	>-8	1592	>-26
PC4	814	>-87	2381	>-235	1566	>-147
PM4	727	>-39	2146	>-118	1419	>-79
PN3	688	>-6	2028	>-26	1340	>-19
PS2	682	>-12	2002	>-14	1320	>-4
PP1	670	>+110	1988	>-12	1317	>-121
TIM	780	>-112	1976	>-116	1196	>-4
MU1	668	>+6	1860	>-13	1192	>-19
MW1	674	>+472	1847	>+410	1173	>-62
MO5	1146	>-669	2257	>-686	1111	>-17
AA6	477	>-73	1571	>-356	1094	>-283
WL2	404	>+2	1215	>-161	811	>-163
EL2	406	>-342	1054	>-702	648	>-360
MN1	64		352		288	

Table B-23.

Discounted Benefits and Costs for Resource Groups *
(million dollars)

Bench- mark	Present Net Value	Discounted Benefits				Discounted Costs				
		Timber	Recreation	Range	Other	Timber	Roads	Recreation	Range	Other
PC3	1600	2020	321	6	8	347	272	38	1	95
PR2	1592	2061	314	6	8	372	289	38	1	95
PC4	1566	2056	312	6	7	386	293	38	1	95
PM4	1419	1808	324	6	9	332	259	39	1	95
PN3	1340	1685	329	6	9	315	234	42	1	95
PS2	1320	1658	330	6	9	311	232	42	1	95
PP1	1317	1656	319	6	8	302	229	42	1	95
TIM	1196	1645	319	6	7	384	252	47	1	95
MU1	1192	1654	193	6	7	299	230	42	1	95
MW1	1173	1641	193	6	7	304	231	42	1	95
MO5	1111	1973	274	6	4	547	463	40	1	95
AA6	1094	1183	371	6	12	173	160	47	1	96
WL2	811	830	369	5	12	143	107	56	1	96
EL2	648	665	373	4	12	135	111	63	1	96
MN1	288	0	339	0	13	.25	15	6	0	44
...

* The comparison of individual resource costs and benefits from this table can be misleading because the cost figures for an individual resource do not contain those costs that are "joint" and are included only in the "Other Costs" category.

b. Conclusions and Effects on PNV from Resource Supply
Potentials, Min Level and Current Management Benchmarks

The Minimum Level Benchmark defines the outputs associated with custodial management and the unavoidable costs and benefits of public ownership. Management under this benchmark reduces PNV by 78 percent. The unavoidable costs are about \$2.5 MM annually or 20 percent of the 1980 budget. The run defines the lowest elk winter range potential of all the benchmarks decreasing from 11,628 annually in the first decade to 2,759 elk in decade 15. This is because no timber management occurs on the winter range. The capacity for primitive and semiprimitive visitor days are the highest the Forest can maintain for all 15 decades.

Run compared: Run #7 (PS2) PNV = \$1320 MM
 Run #12 (MN1) PNV = \$288 MM
Reduction in PNV: \$1,032 MM.

The Maximum Wildlife Benchmark defines the maximum potential to produce elk from winter and summer range. Management under this benchmark reduces PNV by 51 percent. Potential winter range is the limiting factor, given the constraints of this run. Over the planning horizon, cutting timber on the winter range will produce more elk than burning. Burning produces more elk in decade one, but by decades three and four forage production that results from timber cutting in decade one will produce three times as many elk as burning.

The elk numbers on winter range averaged 22,836 elk annually for 15 decades. However, in decades one to three the elk numbers only averaged 13,460 elk. As a result, another FORPLAN run was made to maximize potential winter range in decades one to five only. (See planning record, FORPLAN Benchmark Runs, run ID: EL3.) This run resulted in a slight decrease in the average potential winter range for 15 decades (22,020 elk) but in decades one to three the average potential increased to 30,612 elk. This was accomplished by burning more winter range (42,000 acres vs 16,770 acres) and scheduling more timber harvest in the early decades.

Very little timber harvest is occurring on the roadless summer range to achieve the 31,000 potential elk. This is based on the philosophy of the less disturbance the elk receive the more elk produced.

Run compared: Run #7 (PS2) PNV = \$1320 MM
 Run #13 (EL2) PNV = \$648 MM
Reduction in PNV: \$672 MM.

The Maximum Timber Benchmark defines the maximum potential for timber given the same set of constraints as the maximum PNV run (PS2). Management under this benchmark reduces PNV by 9 percent. The drop in PNV is a result of maximizing timber rather than PNV, which indicates some low value timberlands enter the solution when using the maximum timber objective function. The harvest schedule for this run is the highest possible timber output from the Forest, given the constraint set and objective function used.

Run compared: Run #7 (PS2) PNV = \$1320 MM
 Run #14 (TIM) PNV = \$1196 MM
Reduction in PNV: \$124 MM.

The Maximum Wilderness Benchmark displays the outputs and effects of having the maximum amount of land in wilderness management while the watersheds on the developed portions of the Forest are being managed at low fishable standard. Management under this alternative reduced PNV by 39 percent. The model is able to maintain near current harvest levels from only the developed portions of the Forest and still meet the minimum requirement of fisheries.

Run compared: Run #7 (PS2) PNV = \$1320 MM
 Run #15 (WL2) PNV = \$811 MM
Reduction in PNV: \$509 MM.

The Current Management Benchmark is used as a base in comparing alternatives and as a measure of effects under a "current direction" alternative. PNV is reduced by 17 percent. This reduction in PNV is primarily the result of the first decade harvest constraint of 170 MMBF/yr. Other more restrictive constraints that also caused a reduction in PNV are the various prescription constraints applied to mirror current management higher sediment constraints, and requiring a minimum of 15,000 elk on winter range.

Run compared: Run #7 (PS2) PNV = \$1320 MM
 Run #16 (AA6) PNV = \$1094 MM
Reduction in PNV: \$226 MM.

c. Production Potentials

The benchmarks provide information about production and potential economics of the Forest. This section discusses the potential and efficient mix of resource outputs.

(1) Economic Potential of Max PNV with Assigned Values (Benchmark PS2)

The maximum PNV of the Forest is defined in the Max PNV Benchmark (PS2) with the following constraints: nondeclining yield with a link to long-term sustained yield and a 20 percent upper bound, rotations based on 95 percent of the CMAI, and minimum management requirements. The PNV of this benchmark is \$1,320 MM. Other benchmarks analyzed had higher PNV's, but did not meet the timber policy and legal requirements to be considered in this analysis.

Timber management is cost efficient on 94 percent of the tentatively suitable lands, or 1,249.6 M acres. Timber harvest in the first decade averages 297 MMBF per year. About 82 percent of the suitable lands are designated to a timber emphasis, 8 percent to wildlife emphasis, 9 percent to riparian, and 1 percent to visual management. Summer range is limiting elk production in all decades but the first. Capacity for primitive and semiprimitive recreation reduces to 633,150 visitor days by decade 15.

(2) Fixed Costs of Public Land Ownership (Benchmark MN1)

The cost of maintaining the Forest in public ownership, protecting existing facilities, and providing for uncontrollable outputs is \$2.5 MM. The major activities include:

- Facilities maintenance would be reduced to levels which protect the incidental user.
- Fire suppression would be limited to preventing safety hazards and protecting adjacent landowners.
- Timber harvest, road construction, and livestock grazing activities would be limited to completing current contracts.

The present value of the costs is \$64 MM, and the distribution is:

Recreation/Wildlife	11 percent
Roads	23 percent
Timber	<1 percent
Other	65 percent

(3) Timber Potential (Benchmarks TIM, WL2)

The Forest has the ability to produce more timber than it is currently producing. The impact on fisheries would be substantial due to necessary road construction and other sediment-producing activities. The Maximum Timber Benchmark, TIM, was modeled to address the capability of harvesting maximum yields of timber on the entire Forest. An objective of maximizing timber for 15 decades was run with the following constraints: NDY with an upper bound of 20 percent, harvest floor of 160 MMBF/yr and a ceiling of 478 MMBF/yr, rotations based on 95 percent CMAI, and MMR's. First decade timber harvest averages 326 MMBF/yr, and the long-term sustained yield (LTSY) is about 600 MMBF/yr.

The Maximum Wilderness Benchmark (WL2) displayed a maximum of 146 MMBF/yr. This would be produced in the first decade from the developed portion of the Forest when using a low fishery objective. The developed portion of the Forest has a LTSY of about 266 MMBF/yr.

(4) Anadromous Fisheries (Benchmark MN1)

Annually, the Forest has the biological potential to produce 717,500 anadromous smolts (summer steelhead and spring chinook) and 598,400 resident fish. The Forest's fish habitat is currently producing 571,500 anadromous smolts and 523,600 resident fish.

Timber harvesting/road construction activities cause sediment which has a detrimental effect on fisheries habitat. Since the minimum level run does not have timber harvest or road construction, it produces the maximum potential for fisheries habitat.

(5) Wildlife Potential (Benchmark EL2)

The average potential for elk on winter range is 22,836 elk annually. The average potential on summer range is 31,000 elk annually.

Potential winter range is the limiting factor, given the constraints of this run. Over the planning horizon, cutting timber on the winter range will produce more elk than burning. Burning produces more elk in decade one, but by

decades three and four, forage production that results from timber cutting in decade one will produce three times as many elk as burning. The elk on winter range averaged 22,836 elk annually for 15 decades. However, in decades one-to-three the elk only averaged 13,460. As a result, another FORPLAN run was made to maximize potential winter range in decades one to five only. (See planning record, FORPLAN Benchmark Runs, run ID EL3.) This run resulted in a slight decrease in the average potential winter range for 15 decades (22,020 elk), but in decades one-to-three, the average potential increased to 30,612 elk. This was accomplished by burning more winter range (42,000 acres vs 16,770 acres) and scheduling more timber harvest in the early decades.

Very little timber harvest is occurring on the roadless summer range to achieve the 31,000 elk potential. This is based on the philosophy of the less disturbance the elk receive the more elk will be produced.

The Minimum Level Benchmark (MN1) defines the lowest potential elk winter range of the benchmarks decreasing from 11,628 elk annually in the first decade to 2,759 elk in decade 15. This is due to the lack of timber management and burning on the winter range. Forage production declines as the trees get older.

(6) Potential Wilderness (Benchmark WL2)

The roadless resource consists of 950,311 acres in 16 separate areas. All of the Forest's roadless areas are presently, by definition, eligible for inclusion in the National Wilderness Preservation System. They range in size from 100 acres to 235,510 acres. The Maximum Wilderness Benchmark designates all 950,311 acres to recommended wilderness. Along with existing wilderness, Wild and Scenic River, and Research Natural Areas, the total classified area would be 1,209,476 acres or 66 percent of the Forest.

(7) Potential Dispersed Recreation (Benchmark MNI)

The highest level of semiprimitive recreational capacity that can be maintained is 332,000 visitor days/year. This is produced from the roadless areas and does not include wilderness visitor days.

(8) Resource and Economic Potential Under Current Management (Benchmark AA6)

Continuing current management with no budget constraint but a first decade harvest constraint of 170 MMBF/yr provides for a moderate level of roadless, wilderness, livestock forage, and elk winter range forage. Timber harvest starts at 170 MMBF/year for the first decade, then increases to 519 MMBF/year for decade 15. Of the 1,041.0 M acres in the suitable timber base, 73 percent is assigned to the timber emphasis; 8 percent is assigned to the wildlife emphasis; 9 percent is assigned to visuals; and 10 percent is assigned to the riparian emphasis.

d. Resource Relationship

(1) Timber Harvest/Roadless and Wilderness Designation

Timber harvest levels and roadless/wilderness designations are inversely related. The mix of resources which maximizes PNV (PS2) allows no additional roadless/wildernesses and 98 percent of the potential timber harvest (596 MMBF). As the roadless/wilderness is increased above the minimum, the efficient level of harvest over 150 years decreases. When roadless/wilderness is maximized (950,311 acres), the efficient level of timber output is 266 MMBF, or 44 percent of the potential.

(2) Timber Harvest/Livestock Forage

Creating livestock forage with timber harvest could increase potential livestock grazing by 20 percent. The mix of timber harvest and livestock forage which maximizes PNV for assigned values is 98 percent of the potential timber (596 MMBF) and 100 percent of potential livestock (209 M AUM). Anticipated livestock use is expected to increase to 209 M AUM by the year, 2030.

(3) Timber Harvest/Elk Forage on Winter Range

Creating elk forage on winter range with timber harvest would increase potential elk habitat from 15 M elk to 23 M elk. The mix of timber harvest and elk forage which maximizes PNV for assigned values is 98 percent of the potential timber harvest (596 MMBF) and 95 percent of the potential elk (22 M elk).

(4) Timber Harvest/Elk Production on Summer Range

Timber harvest levels and elk production on summer range are inversely related. The maximum potential for elk production on summer range is 31,000 elk. This is achieved by designating the majority of the roadless summer range to roadless management. This is based on the philosophy of the less disturbance the elk receive, the more elk will use the summer range. The mix of timber harvest and elk production on summer range that maximizes PNV for assigned values is 98 percent of the potential timber harvest (596 MMBF) and 32 percent of the potential elk on summer range (9,850 elk).

(5) Timber Harvest/Anadromous Fisheries Habitat

Timber harvest levels directly affect anadromous fisheries habitat by the adverse impact of road-building on stream habitat. Timber harvest was limited in all benchmarks to habitat to support minimum viable populations of anadromous fish. The mix of timber harvest and anadromous fish habitat which maximizes PNV is 98 percent of the potential timber harvest (596 MMBF) and 60 percent of potential anadromous fish habitat. Maximizing potential anadromous fish is attained at the minimum level, where timber harvest is discontinued.

(6) Livestock Forage/Roadless
and Wilderness Designation

Producing high levels of roadless areas and livestock forage is not possible because roadless area designation precludes creating transitory forage with timber harvest.

(7) Elk Forage/Roadless Area
and Wilderness Designation

Elk forage production on winter range is decreased when roadless area designation is maximized because the acres of timber harvest and burning which create forage are decreased. Elk forage production decreases to 13,195 elk or only 57 percent of potential (23 M elk).

3. Management Implications of the Benchmark Analysis

a. Ability to Meet RPA Objectives
as Assigned in the Regional Guide

Following is a discussion of the Forest Rangeland Renewable Resource Planning Act (RPA) objectives for the Clearwater National Forest as contained in the Regional Guide, and the outlook for meeting those objectives based on the information gained from the benchmark analysis.

The RPA program objectives assigned to the Forest are based on the 1980 assessment.

(1) Recreation

(a) Developed: Developed recreation was not included as a scheduled output in the FORPLAN model. However, estimates based on total capacity and projected demand indicate that existing facilities are adequate to meet demand until about 2005. This projection does not consider the distribution of that use.

(b) Roaded Natural: The capacity to provide recreation in a roaded natural setting exceeds current use and RPA projected demand in all benchmarks.

(c) Semiprimitive: Due to the large amount of roadless area, all benchmark runs showed excess capacity for this type of recreation in the early decades. As the roadless areas became developed for timber production in benchmark runs with objectives of maximizing timber or present net value, the projected demand for roadless recreation exceeded capacity. This occurred at about the end of the second decade. The minimum level run showed the highest possible output for primitive and semiprimitive recreation at 332,000 visitor days annually for all decades. Both the minimum level and maximum elk runs satisfied demand for this type of recreation until about the fourth decade.

(d) Wilderness: All of the benchmarks were run with only the existing Selway-Bitterroot Wilderness for wilderness recreational outputs, except the Maximum Wilderness run in which all roadless areas were designated to wilderness. Under Maximum Wilderness the projected demand would be met until the end of the fourth decade.

(2) Range

RPA objectives for range forage can be met within the existing allotments. A large potential exists to accommodate increased animal unit month outputs from transitory range if demand increases.

(3) Timber

Potential timber is above the RPA objective in all runs that have a maximum PNV or timber objective function. It appears, however, that only an alternative that emphasizes timber production on nearly all suitable land will fully meet or exceed the RPA objectives for timber harvest. Alternatives that contain substantial wilderness or unroaded management proposals and/or high wildlife or fisheries objectives are not likely to meet RPA timber output objectives.

Reforestation and timber stand improvement (TSI) objectives as shown in the Regional Guide appear high. Reforestation acreage should be about 6000 acres annually and TSI about 1500 acres. These acreages will be established in the Preferred Alternative, but will probably need to be revised downward from the Regional Guide.

(4) Wildlife

The existing population is estimated to be greater than 15,000 animals. The Regional Guide goals for the Forest are 19,900 elk by 1990 which could be reached by the year 2000 in most alternatives.

(5) Fisheries

Potential anadromous and resident fish as shown in the Regional Guide are realistic. The habitat objectives, however, are not realistic for the benchmark runs that had as an MMR constraint only a minimum viable fishery. Alternatives formulated to meet higher fish habitat objectives than minimum viable will require further constraints on sediment production.

(6) Research Natural Areas

Research natural area targets are attainable with the exception of FESC/SYAL (rough fescue-snowberry), which to our knowledge is not represented in the Forest.

b. Ability to Resolve Public Issues and Concerns

The major issues center around timber production, recommended wilderness, potential elk population, sediment produced and the resulting impact to fisheries, and the transportation system needed to implement the Plan. Other issues relating to the major issues are visual resource, special areas, stream candidates for Wild and Scenic River status, energy transmission corridor, and cultural resources.

Because of the considerable decision space that is available in the major resource areas there appears to be opportunities to resolve most issues. Regardless of available decision space, it is not likely that the roadless area

designation issue can be resolved to everyone's satisfaction. Designation of "nonwilderness" roadless areas to any management that precludes development will probably be opposed. Designations that call for roadless area development, especially some key areas will no doubt be opposed.

Some concerns relating to roadless area development may be mitigated through scheduling of activities and by limiting access, as is prescribed under the elk/timber management standards for key elk summer range. These measures are also responsive to the efforts for gray wolf recovery.

Addressing the water quality concerns and fishery habitat conditions will be constraining on the rate of development and harvest that can take place in some drainages, particularly those impacted in the past. Scheduling of activities can reduce the effects up to a point, but a reduction of timber harvest will result in alternatives with high fish objectives.

c. Opportunities to Provide Levels and Mixes of Outputs in Alternatives

High potential for timber outputs are shown in all benchmark runs except Minimum Level, Maximum Elk, and Maximum Wilderness. With all legal constraints and MMR's being applied, the potential for timber production is about 100 MMBF/yr above the RPA levels assigned the Forest in the Regional Guide. As additional constraints are applied by alternative, a wide range of timber outputs should result with some being at or above the RPA level for timber.

On the high nonmarket end of the "reasonable range of alternatives" the large roadless area acreage of the Clearwater provides a wide decision space and opportunities for high levels of nonmarket outputs. The realistic level at the nonmarket end would be an alternative that maintains all or most of the roadless areas in a roadless condition while continuing to provide market outputs from the developed portion of the Forest.

Due to the large acreage of highly productive land and the large acreage of undeveloped land, many options are still open. This provides an opportunity to show a wide range of alternative levels and mixes of outputs.

VII. FORMULATION OF ALTERNATIVES

A. OVERVIEW

A Forest plan alternative is a mix of management prescriptions applied in specific amounts and locations to achieve desired management goals and objectives. According to NFMA (36 CFR 219.12f) alternatives must:

- Be within the maximum and minimum potential resource of the Forest to provide a full range of resource outputs and expenditure levels.
- Be formulated to facilitate analysis of effects on PNV, resource use, and environmental trade-offs among alternatives.

- Be formulated to facilitate evaluation of present net value, benefits, and costs of achieving various outputs and nonpriced benefits.
- Address and respond differently to major public issues, management concerns, and resource opportunities.
- Represent the most cost-efficient combination of management prescriptions to meet the objectives of the alternative.
- State the condition and uses that will result from long-term implementation.
- State what goods and services will be produced, including timing and flow of outputs, and the costs and benefits generated.
- State the resource management standards and guidelines.
- State the purposes of the proposed management direction.

Changes in Section VII and VIII have been made between the Draft EIS and Final EIS as a result of public review of the Draft EIS. The following is a list of those changes:

- Alternative K has been added to development of alternatives;
- Trade-offs among alternative and economic trade-off sections has been reviewed and revised as necessary.
- Alternative K has been added to economic trade-offs section.
- A table has been added in economic trade-off section ranking alternatives by PNV.
- In Section VIII, D, a discussion about timber supply/demand and timber resource land suitability has been added. This section is based on the results of the Idaho Timber Supply study.
- Section VIII, E, has been added. This is a sensitivity analysis section. In this section, changes made to FORPLAN are discussed, effects of these changes are analyzed and a comparison of 1980 timber prices and trends to 1985 prices and trends is presented.

Formulating alternatives is planning step number five in the Forest planning process following the analysis of the management situation (AMS). During the analysis of the management situation a determination was made of the ability of the Forest to supply goods and services. Maximum and minimum output levels were established. These levels form the range within which the alternatives were developed.

Two specific alternatives are required. One alternative must be developed which responds to and incorporates the RPA program tentative resource objectives. Another alternative must be developed to reflect the current and expected level of goods and services produced should current management be

continued (the "current direction" alternative). The process for formulating alternatives can best be explained in a series of steps:

Step 1. Major public issues were identified through public involvement. Internal management concerns were added to the list of issues. (See Appendix A.) These issues and concerns were reviewed by an ID team and consolidated into a set of planning questions to be answered.

Step 2. A comprehensive multi-resource data base was formed based on the identified issues and concerns and stored in a computer retrieval system.

Step 3. Land analysis areas with similar physical and biological attributes were identified. The capability, suitability, and management opportunities of specific areas of the Forest were considered in this step.

Step 4. A set of management prescriptions was prepared to represent a variety of possible ways and intensities to manage the Forest.

Step 5. The 362 analysis areas identified in Step 4 were assigned management prescriptions. Some analysis areas were assigned only one prescription while others were assigned a variety of prescriptions. Single prescription assignments limited the model's designation choices. (The applications of prescriptions to analysis areas results in management areas.)

Step 6. Resource outputs and the associated costs and dollar values that would result when a prescription was implemented were calculated and entered into FORPLAN.

Step 7. Demand was estimated for the resources involved in the planning questions.

Step 8. Supply potentials were determined using FORPLAN. Various assumptions, constraints, and objectives were used to establish benchmarks for supply potentials of each resource. Benchmarks were established for the minimum, maximum, and constraint resource levels and maximum present net value. Existing resource supply and projected demand were compared to supply potentials of each benchmark. Opportunities to resolve issues and management concerns were identified for each resource by comparing existing and projected demand to potential production levels. These potentials, when compared to the current direction, identified opportunities and/or need for change. This step concluded the analysis of the management situation.

Step 9. Alternative objectives were established to provide a broad range of options for future management. Selected benchmarks were used to define upper and lower limits for the production of each resource. These upper and lower limits outlined the "decision boundaries" for the resources. The ID team considered expected use, supply, potential (upper and lower limits), and evaluated public input to establish the range of alternatives within the decision spaces. Descriptions were written to define the resource management intent for each alternative.

Step 10. FORPLAN was again used to estimate the outputs and costs for each alternative by reflecting the objective of the alternative through a given set

of constraints.

Step 11. The results of the FORPLAN analysis for each alternative were evaluated to assure conformance with laws, policies, and guidelines. Refinements were made to insure that each alternative could be achieved.

1. Cost Efficiency

The ID team incorporated cost efficiency into the planning process. First, the most cost efficient prescriptions were identified. Second, the ID Team developed different alternatives and identified the necessary constraints to address specific objectives, issues, and concerns. Third, constraints were assigned to FORPLAN with an objective function of maximizing present net value for each alternative.

Each alternative resulted in a different set of prescriptions, which produced a different combination of priced and nonpriced outputs. All constraints had to be satisfied, or it would result in an infeasible run. The methodology used in alternative formulation and evaluation is discussed in Section IV of this Appendix.

B. COMMON CONSTRAINTS

The constraints applied to all alternatives resulted from NFMA regulations (36 CFR 219), administration policy (Peterson, May 13, 1983), and suitability criteria identified in Forest Plan Note 169.

1. Constraint: Require the timber harvest flow to be nondeclining in all alternatives except the Departure E Alternative.

Purpose: To provide a sustained yield of wood products.

Rationale: This assumes a constant supply or upward trend in timber supply.

Trade-off: Nondeclining yield affects timberland suitability by designating marginal lands to timber management prescriptions. Without this constraint, lands are designated to minimum level.

2. Constraint: Insure an appropriate level of timber inventory at the end of the planning horizon.

Purpose: To assure that harvestable timber will be available in the decades immediately following the end of the planning horizon.

Rationale: This assumes a future sustained yield of timber harvest.

Trade-off: Ending inventory constraints could affect PNV by limiting the harvest in early decades when net stumpage values are maximized.

3. Constraint: Apply a sequential upper bound constraint (20 percent) to the volume of timber harvested.

Purpose: To restrict the increase in timber harvest from one decade to the next.

Rationale: This increase (20 percent) is about equal to the addition of one average sized sawmill within the Clearwater National Forest's zone of influence.

Trade-off: This reduces PNV. (See Section VI.)

continued (the "current direction" alternative). The process for formulating alternatives can best be explained in a series of steps:

Step 1. Major public issues were identified through public involvement. Internal management concerns were added to the list of issues. (See Appendix A.) These issues and concerns were reviewed by an ID team and consolidated into a set of planning questions to be answered.

Step 2. A comprehensive multi-resource data base was formed based on the identified issues and concerns and stored in a computer retrieval system.

Step 3. Land analysis areas with similar physical and biological attributes were identified. The capability, suitability, and management opportunities of specific areas of the Forest were considered in this step.

Step 4. A set of management prescriptions was prepared to represent a variety of possible ways and intensities to manage the Forest.

Step 5. The 362 analysis areas identified in Step 4 were assigned management prescriptions. Some analysis areas were assigned only one prescription while others were assigned a variety of prescriptions. Single prescription assignments limited the model's designation choices. (The applications of prescriptions to analysis areas results in management areas.)

Step 6. Resource outputs and the associated costs and dollar values that would result when a prescription was implemented were calculated and entered into FORPLAN.

Step 7. Demand was estimated for the resources involved in the planning questions.

Step 8. Supply potentials were determined using FORPLAN. Various assumptions, constraints, and objectives were used to establish benchmarks for supply potentials of each resource. Benchmarks were established for the minimum, maximum, and constraint resource levels and maximum present net value. Existing resource supply and projected demand were compared to supply potentials of each benchmark. Opportunities to resolve issues and management concerns were identified for each resource by comparing existing and projected demand to potential production levels. These potentials, when compared to the current direction, identified opportunities and/or need for change. This step concluded the analysis of the management situation.

Step 9. Alternative objectives were established to provide a broad range of options for future management. Selected benchmarks were used to define upper and lower limits for the production of each resource. These upper and lower limits outlined the "decision boundaries" for the resources. The ID team considered expected use, supply, potential (upper and lower limits), and evaluated public input to establish the range of alternatives within the decision spaces. Descriptions were written to define the resource management intent for each alternative.

Step 10. FORPLAN was again used to estimate the outputs and costs for each alternative by reflecting the objective of the alternative through a given set

of constraints.

Step 11. The results of the FORPLAN analysis for each alternative were evaluated to assure conformance with laws, policies, and guidelines. Refinements were made to insure that each alternative could be achieved.

1. Cost Efficiency

The ID team incorporated cost efficiency into the planning process. First, the most cost efficient prescriptions were identified. Second, the ID Team developed different alternatives and identified the necessary constraints to address specific objectives, issues, and concerns. Third, constraints were assigned to FORPLAN with an objective function of maximizing present net value for each alternative.

Each alternative resulted in a different set of prescriptions, which produced a different combination of priced and nonpriced outputs. All constraints had to be satisfied, or it would result in an infeasible run. The methodology used in alternative formulation and evaluation is discussed in Section IV of this Appendix.

B. COMMON CONSTRAINTS

The constraints applied to all alternatives resulted from NFMA regulations (36 CFR 219), administration policy (Peterson, May 13, 1983), and suitability criteria identified in Forest Plan Note 169.

1. Constraint: Require the timber harvest flow to be nondeclining in all alternatives except the Departure E Alternative.
Purpose: To provide a sustained yield of wood products.
Rationale: This assumes a constant supply or upward trend in timber supply.
Trade-off: Nondeclining yield affects timberland suitability by designating marginal lands to timber management prescriptions. Without this constraint, lands are designated to minimum level.
2. Constraint: Insure an appropriate level of timber inventory at the end of the planning horizon.
Purpose: To assure that harvestable timber will be available in the decades immediately following the end of the planning horizon.
Rationale: This assumes a future sustained yield of timber harvest.
Trade-off: Ending inventory constraints could affect PNV by limiting the harvest in early decades when net stumpage values are maximized.
3. Constraint: Apply a sequential upper bound constraint (20 percent) to the volume of timber harvested.
Purpose: To restrict the increase in timber harvest from one decade to the next.
Rationale: This increase (20 percent) is about equal to the addition of one average sized sawmill within the Clearwater National Forest's zone of influence.
Trade-off: This reduces PNV. (See Section VI.)

4. Constraint: Protect riparian zones by limiting timber harvest to about 13 percent of the suitable timber base, the percentage of the suitable base that is riparian area, and by restricting access to 5.6 percent per decade. A shelterwood harvest pattern will limit the amount of timber harvest in future decades.
Purpose: To protect the areas most critical to a wide range of resources including timber, wildlife and fish, recreation, and water.
Rationale: This prevents overcutting of riparian ecosystems.
Trade-off: Riparian zone protection reduces PNV by limiting the amount of timber harvest and by increasing logging and timber management costs to meet the harvest and road restrictions needed to protect the resources within the riparian zone.
5. Constraint: Assure maximum timber harvest in the first decade is less than or equal to 1062 million cubic feet (478 million board feet per year).
Purpose: To restrict the first decade maximum timber harvest volume.
Rationale: This limits the harvest volume to be less than or equal to mill capacity. The manufacturing capability of sawmills within the Clearwater National Forest's marketing area for the past five years is 1062 million cubic feet.
Trade-off: There are no trade-off based on the benchmark analysis. All first decade timber harvest volumes are below this constraint.
6. Constraint: Set a minimum rotation ages at the age where 95 percent of the CMAI timber volume occurs.
Purpose: To assure that timber is harvested at or beyond its maximum mean annual growth rate.
Rationale: This provides rotation ages that maintain high productivity and that abide by Forest Service Manual direction.
Trade-off: This creates a slight reduction in PNV. (See Section VI.)
7. Constraint: Set a 15 percent access constraint for suitable timberland on roadless areas in all alternatives except Alternative A (current direction).
Purpose: To limit the area of roadless land accessed and the volume of timber harvested in decade one.
Rationale: This prohibits the large increase in areas and volume accessed by spatially distributing sawtimber areas. Budget ceilings and work-year-equivalents (manpower) limit the Forest's ability to develop roadless areas.
Trade-off: This reduces PNV and first decade timber harvest. Effects vary by alternative.
8. Constraint: Apply a visual/timber management prescription to all major roads and trails except in Alternatives B and C.
Purpose: To provide management restrictions for recreational benefits and visual and aesthetic values.
Rationale: This maintains recreational and visual resources compatible with nonintensive timber management.
Trade-off: The economic effect of this prescription constraint has not been analyzed.

9. Constraint: Preclude timber harvest from the existing Selway-Bitterroot Wilderness.
Purpose: To implement legislation.
Rationale: Wilderness legislation precludes timber management.
Trade-off: The economic effect of precluding timber management from the wilderness has not been analyzed.
10. Constraint: Preclude timber harvest and development within the Lochsa Research Natural Area.
Purpose: To protect the RNA special features.
Rationale: The RNA precludes development activities.
Trade-off: The economic effect of precluding development activities has not been analyzed.
11. Constraint: Apply only the recreation river prescription to the Middle Fork-Lochsa Wild and Scenic River corridor.
Purpose: To avoid selection of prescriptions which may be incompatible with the designated recreation river corridor.
Rationale: This is a management decision.
Trade-off: The economic effect of precluding development activities has not been analyzed.
12. Constraint: Do not assign prescriptions that include regulated timber harvest to nonforest lands, noncommercial Forest land, and other lands not suitable for timber production.
Purpose: To avoid having the model select lands for timber harvest which are incapable of commercial timber production or are unsuitable for harvest of timber.
Rationale: This meets Forest Service Manual direction.
Trade-off: The economic effect of precluding development activities has not been analyzed.
13. Constraint: Exclude the big-game summer range with timber management prescription (C2) from all alternatives except Alternative A, current direction.
Purpose: To allow only intensive timber management on the roaded summer range.
Rationale: Past timber cutting has already occurred on these areas.
Trade-off: Timber production will be decreased as sediment becomes constraining.

C. DEVELOPMENT OF ALTERNATIVES

1. Alternative A (Current Direction)

The purpose of Alternative A is to continue current management direction as described in the approved Multiple Use Plan (Part I) and the Lowell, White Pine, and Elk River Unit Plans. This alternative constitutes the "no action" or "current direction" alternative.

The criteria and assumptions underlying the development of this alternative are:

- a. Maintain existing wilderness character in existing wilderness.
- b. Emphasize visual quality along existing road and trail corridors.
- c. Maintain elk habitat on winter ranges.
- d. Recommend the administratively selected RARE II areas for wilderness.
- e. Maintain existing RNA.
- f. Maintain the current Forest budget level.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates RARE II wilderness recommendations (190,400 acres) to the wilderness prescription.
Purpose: To meet recommendation for wilderness in the management area descriptions.
Rationale: Meets current land management planning requirements.
2. Constraint: Applies a designation constraint to 46,100 acres for unroaded recreation and 46,600 acres for special fisheries habitat.
Purpose: To provide large areas for unroaded recreation and to meet resource management constraints for fish.
Rationale: Provides 46,100 acres for unroaded recreation and meets management's objectives for key fish areas.
3. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objectives.
 Designed to meet moderate fishable in all Districts except min viable in the Palouse District and low fishable in the roaded portion of the Pierce District. "No effect" will be the objective in wilderness or unroaded areas. (See Section III for a definition of the water quality/fishery objectives.)
Rationale: Provides water quality for fish habitat to meet the intent of this alternative.
4. Constraint: Applies a timber harvest volume constraint equal to 369 million cubic feet (170 million board feet/year) in the first decade.
Purpose: To provide a timber harvest level comparable to current management.
Rationale: Comparable to the actual budget level expended by the Forest.
5. Constraint: Applies an output constraint of more than 15,000 elk on winter range. However, the actual number of elk assumed to be produced is a minimum of 16,500 elk. The coefficients in FORPLAN only estimate 90 percent of the elk on winter range. (See Section III.)
Purpose: To meet the elk population objectives established for this alternative.
Rationale: Provides elk habitat requirements comparable to the number of elk currently in the Forest.

2. Alternative B

The purpose of the timber and forage alternative is to emphasize maximum production of market outputs. Timber production is emphasized on all available

productive lands. No additional wilderness is recommended in this alternative. This alternative constitutes the maximum timber alternative.

The criteria and assumptions underlying the development of this alternative are:

- a. Emphasize timber production outside major road corridors.
- b. Recommend no new areas for wilderness.
- c. Designate no areas to unroaded recreation.
- d. Provide road system for mineral, oil, and gas exploration.

The constraint utilized to meet the criteria and assumptions is:

1. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objectives designed to meet low fishable in all Districts except minimum viable in the Palouse District. "No effect" will be maintained in the existing wilderness.
Rationale: Provides water quality for fish habitat to meet the intent of this alternative.

3. Alternative C

The purpose of the timber, range, fish, and elk alternative is to maintain a high level of market outputs and provide moderate fish habitat and elk habitat potential. This alternative provides unroaded recreation on eight areas and proposes wilderness on four areas. This alternative was also designed to meet RPA targets as well as the timber industries' wilderness proposal.

The criteria and assumptions underlying the development of this alternative are:

- a. Emphasize timber production outside major road corridors.
- b. Recommend four areas for wilderness classification, including an addition to the Selway-Bitterroot Wilderness.
- c. Designate eight areas for unroaded recreation.
- d. Recommend 5,167 acres of new RNA's.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 45,500 acres to the wilderness prescription.
Purpose: To provide four additional areas for wilderness classification.
Rationale: Provides areas for wilderness classification which have a high wilderness value and the least amount of conflicts with other resources.
2. Constraint: Applies a designation constraint to 70,700 acres for unroaded recreation.
Purpose: To provide areas for unroaded recreation.
Rationale: Provides areas for unroaded recreation.
3. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objectives of moderate fishable in all District, except minimum viable in the Palouse District and low fishable in the roaded portion of the Pierce District. "No

effect" will be maintained in wilderness or unroaded areas.

Rationale: Provides water quality for fish habitat to meet the intent of this alternative.

4. Alternative D

The purpose is to provide a mix of market and nonmarket outputs with the emphasis on market goods from lands suitable for that purpose. Nonmarket outputs are emphasized on lands less suitable for timber production. This alternative presents as a wilderness proposal those areas and acreages agreed to by the Idaho Congressional Delegation for the Idaho Wilderness Bill.

The criteria and assumptions underlying the development of this alternative are:

- a. Recommend three areas as additions to the wilderness system.
- b. Designate fourteen areas for unroaded recreation.
- c. Emphasize timber production outside major road corridors and visual quality along major roads and trails.
- d. Recommend 5,932 acres of new RNA's.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 130,400 acres to the wilderness prescription.
Purpose: To provide three additional areas for wilderness classification.
Rationale: Provides areas for wilderness classification which have a high wilderness value and the least amount of conflicts with other resources.
2. Constraint: Applies a designation constraint to 201,300 acres for unroaded recreation, 61,600 acres for key elk summer range, and 30,400 acres for special fisheries habitat.
Purpose: To provide large areas for unroaded recreation and to meet the resource management objectives for fish and wildlife.
Rationale: Provides 201,300 acres for unroaded recreation and meets management objectives for key fish and wildlife areas.
3. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objectives designed to meet high fishable except minimum viable in the Palouse District, moderate fishable in Lolo Creek, and low fishable in roaded portion of the Pierce District. "No effect" will be maintained for wilderness or roadless areas.
Rationale: Provides water quality for fish habitat to meet the intent of this alternative.
4. Constraint: Applies an output constraint of more than 17,000 elk on winter range and 21,250 elk on summer range. Actual elk produced from winter range is at least 18,700.
Purpose: To meet the elk population objectives for this alternative.
Rationale: Provides habitat to meet wildlife goals of hunting and recreation.

5. Alternative E

The purpose of this alternative is to provide a moderate increase in market outputs from current levels while maintaining highly fishable habitat in the important fisheries waters and potential elk habitat above that of current management levels. This is the Proposed Action in the Draft Environmental Impact Statement.

The criteria and assumptions underlying the development of this alternative are:

- a. Recommend seven areas for wilderness classification.
- b. Designate seven areas for unroaded recreation.
- c. Emphasize timber production outside major road corridors and visual quality along major roads and trails.
- d. Recommend 5,932 acres of RNA's.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 188,900 acres to the wilderness prescription.
Purpose: To provide seven additional areas for wilderness classification.
Rationale: Provides areas for wilderness classification which have a high wilderness value and the least amount of conflicts with other resources.
2. Constraint: Applies a designation constraint to 73,600 acres for unroaded recreation, 45,100 acres for key elk summer range, and 69,700 acres for special fisheries habitat.
Purpose: To provide large areas for unroaded recreation and to meet the resource management objectives for fish and wildlife.
Rationale: Provides 73,600 acres for unroaded recreation and meets management objectives for key fish and wildlife areas.
3. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objective designed to meet high fishable in all districts including Lolo and Elk Creek except low fishable in the roaded portion of the Pierce District and minimum viable in Palouse District. "No effect" will be maintained for wilderness or unroaded areas.
Rationale: Provides water quality for fish habitat to meet the intent of the State of Idaho's water quality and fishery standards.
4. Constraint: Applies timber volume constraints to the roaded and roadless portion of some of the Districts.
Purpose: To spatially fit this alternative based on District input.
Rationale: Provides more site specific designation of timber data utilized in FORPLAN.
5. Constraint: Applies an output constraint of more than 17,000 elk on winter range and 21,250 elk on summer range. Actual elk produced from winter range is at least 18,700.
Purpose: To meet the elk population objectives of this alternative.
Rationale: Provides habitat to meet wildlife goals of hunting and

recreation.

6. Alternative E1

Alternative E1 provides a variation to the DEIS's Proposed Action by allowing the flexibility to depart from the requirement of a nondeclining timber base sale schedule. While addressing the same issues as Alternative E, this alternative also focuses on the national management concern of the effect of nondeclining yield.

The criteria and assumptions underlying the development of this alternative are the same as Alternative E except for harvest flow.

1. Constraint: Long-term sustained yield (LTSY) is the same as Alternative E (983.4 MMCF/decade).
Purpose: To meet requirement of FSM 2413.42.
Rationale: Required by FSM 2413.42.
2. Constraint: Removes the sequential bound constraint of 0 percent lower bound and 20 percent upper bound.
Purpose: To allow the timber harvest to fluctuate either up or down from one decade to the next.
Rationale: Required by FSM 2413.42 and based on consultation with the Regional Office.

7. Alternative F

The purpose of this alternative is to increase the emphasis on wilderness, potential elk production, and primitive recreation. Market outputs from lands available for that use are at a moderate level. This alternative contains the wilderness proposal by the State of Idaho.

The criteria and assumptions underlying the development of this alternative are:

- a. Recommend five areas for wilderness classification.
- b. Designate eight areas for unroaded recreation.
- c. Emphasize timber production on developed portions of the Forest and visual quality along major roads and trails.
- d. Recommend 8,932 acres of RNA's.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 297,200 acres to the wilderness prescription.
Purpose: To provide five additional areas for wilderness classification.
Rationale: Provides areas for wilderness classification which have a high wilderness value and the least amount of conflicts with other resources.
2. Constraint: Applies a designation constraint to 88,500 acres for unroaded recreation, 142,700 acres for key elk summer range, and 59,300 acres for special fisheries habitat.

Purpose: To provide areas for unroaded recreation and to meet the resource management objectives for fish and wildlife.

Rationale: Provides 88,500 acres for unroaded recreation and meets management objectives for key fish and wildlife areas.

3. Constraint: Applies an output constraint on sediment.

Purpose: To meet the water quality/fishery objectives of high fishable in all Districts except minimum viable in Palouse District, moderate fishable in Lolo Creek, and low fishable in the roaded portion of Pierce District. "No effect" will be maintained for unroaded or wilderness.

Rationale: Provides water quality for fish habitat to meet the intent of this alternative.

4. Constraint: Applies an output constraint of more than 19,000 elk on winter range and 23,750 elk on summer range. Actual number of elk produced on winter range will be 20,900.

Purpose: To meet the elk population objectives of this alternative.

Rationale: Meets the Regional Guide goal of providing at least 19,900 elk by 1990 from the winter range.

8. Alternative G

The purpose of this alternative is to provide a high level of wilderness and unroaded recreation from the roadless areas of the Forest while emphasizing intensive timber management on areas presently developed or areas especially suited for timber production. Fisheries and elk production are at high levels in the roadless portions and at moderate levels in areas designated for timber production. This alternative contains the Wilderness Coalition's proposal for wilderness.

The criteria and assumptions underlying the development of this alternative are:

- a. Recommend nine roadless areas with high wilderness quality and manageable boundaries for wilderness classification.
- b. Emphasize timber production outside major road corridors and visual quality along major roads and trails.
- c. Recommend 5,267 acres of research natural areas (RNA's).

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 454,000 acres to the wilderness prescription.

Purpose: To provide nine additional areas for wilderness classification.

Rationale: Provides areas for wilderness classification which have a high wilderness value and minimize conflicts with other resources.

2. Constraint: Applies an output constraint on sediment.

Purpose: To meet the water quality/fishery objectives of low fishable in all the Districts except minimum viable in the Palouse District.

"No effect" will be maintained for unroaded or wilderness.

Rationale: Provides water quality for fish habitat to meet the intent of this alternative.

9. Alternative H

The purpose of the alternative is to provide wilderness recreation on approximately 75 percent of the roadless areas and to emphasize nonmarket values over market values on the portions of the Forest that are not recommended for wilderness. This is the high nonmarket alternative.

The criteria and assumptions underlying the development of this alternative are:

- a. Recommend eleven roadless areas for wilderness classification.
- b. Recommend 8,932 acres of RNA's.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 715,500 acres to the wilderness prescription.
Purpose: To provide eleven additional areas for wilderness classification.
Rationale: Provides areas for wilderness classification which have a high wilderness value and the least amount of conflicts with other resources.
2. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objectives of high fishable in all Districts except moderate fishable in the roaded portion of the Pierce District and low fishable in the Palouse District.
Rationale: Provides water quality for fish habitat to meet the intent of this alternative.
3. Constraint: Applies an output constraint of more than 15,000 elk on winter range and 18,750 elk on summer range. Actual number of elk produced on winter range will be at least 16,500.
Purpose: To meet the elk population objectives of this alternative.
Rationale: Provides habitat to meet wildlife goals of hunting and recreation.

10. Alternative I

The purpose of the low market alternative is to maximize wilderness from all but a few of the roadless areas and provide the highest possible market outputs from the developed portions of the Forest. Another goal is to determine outputs and effects if no additional roadless areas are developed for timber production. This alternative is the maximum wilderness alternative.

The criteria and assumptions underlying the development of this alternative are:

- a. Recommend all roadless areas for wilderness classification.
- b. Emphasize timber production outside major road corridors and emphasize visual quality along major roads and trails.
- c. Recommend 8932 acres of RNA's.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 950,300 acres to the wilderness prescription.
Purpose: To provide sixteen additional roadless areas for wilderness classification.
Rationale: Provides areas for wilderness classification which have a high wilderness value and the least amount of conflicts with other resources.
2. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objectives of high fishable in all Districts except moderate fishable in roaded portion of the Pierce District and low fishable in the Palouse District. "No effect" will be maintained for unroaded or wilderness.
Rationale: Provides water quality for fish habitat to meet the intent of this alternative.
3. Constraint: Applies an output constraint of more than 12,500 elk on winter range and 15,625 elk on summer range. Actual number of elk on winter range will be 13,750.
Purpose: To meet the elk population objectives of this alternative.
Rationale: Provides habitat to meet wildlife goals of hunting and recreation.

11. Alternative J

This alternative is similar to Alternative D in outputs and effects but differs in the amount of roadless area recommended for wilderness and unroaded recreation and the area developed for timber production. This alternative is a compromise wilderness proposal between industry, the wilderness coalition, and local elected officials.

The criteria and assumptions underlying the development of this alternative are:

- a. Recommend eight areas for wilderness classification.
- b. Designate six areas for unroaded recreation.
- c. Emphasize timber production outside major road corridors and visual quality along major roads and trails.
- d. Recommend 5932 acres of RNA's.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 258,300 acres to the wilderness prescription.
Purpose: To provide eight additional areas for wilderness classification.
Rationale: Provides areas for wilderness classification which have a high wilderness value and the least amount of conflicts with other resources.
2. Constraint: Applies an designation constraint to 73,500 acres for unroaded recreation, 65,000 acres for key elk summer range, and 30,400 acres for special fisheries habitat.
Purpose: To provide areas for unroaded recreation and to meet the resource management objectives for fish and wildlife.

Rationale: Provides 73,500 acres for unroaded recreation and meets the management objectives for key fish and wildlife areas.

3. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objectives of high fishable in all Districts except minimum viable in the Palouse District, moderate fishable in Lolo Creek, and low fishable in the roaded portion of the Pierce District. "No effect" will be maintained in unroaded or wilderness.
Rationale: Provides water quality for fish habitat to meet the intent of this alternative.
4. Constraint: Applies an output constraint of more than 17,000 elk on winter range and 21,250 elk on summer range. Actual elk numbers from winter range will be 18,700.
Purpose: To meet the elk population objectives of this alternative.
Rationale: Provides habitat to meet wildlife goals of hunting and recreation.

12. Alternative K (Preferred Alternative)

This alternative was developed after public review of the Draft EIS. Development of this alternative resulted in a new set of constraints in FORPLAN. This is the Preferred Alternative.

The criteria and assumptions underlying the development of this alternative are:

- a. Recommend seven areas for wilderness classification;
- b. Designate five areas for unroaded recreation;
- c. Emphasize timber production outside major road corridors and emphasize visual quality along major roads and trails.
- d. Recommend 7011 acres of new RNA's.

The constraints utilized to meet the criteria and assumptions are:

1. Constraint: Designates 198,200 acres to the wilderness prescription.
Purpose: To provide seven additional areas for wilderness classification.
Rationale: Provides areas for wilderness classification which have a high wilderness value.
2. Constraint: Designates 78,800 acres for unroaded recreation, 45,100 acres for key elk summer range, and 102,440 acres for special fisheries habitat.
Purpose: To provide large areas of unroaded recreation and to meet the resource management objectives for key fish and wildlife areas.
Rationale: Provides 78,800 acres for unroaded recreation and meets management objectives for key fish and wildlife areas.
3. Constraint: Applies an output constraint on sediment.
Purpose: To meet the water quality/fishery objective designed to meet

high fishable in all Districts, including Lolo and Elk Creek except moderate fishable in Beaver Creek, and low fishable in the roaded portion of Pierce District and minimum viable in the Palouse District. "No effect" is maintained for wilderness on unroaded areas.

Rationale: Provides water quality for fish habitat to meet the intent of this alternative.

4. Constraint: Applies a timber prescription to roaded, seedling-sapling condition class on less than 55 percent slope.
Purpose: To maintain these areas in the base.
Rationale: There has been a significant investment in stocking these areas. Even though it is recognized that maintaining these stands in the base may not be economically efficient, the managers decided that since they occur on roaded, highly productive sites they should remain in the base.
5. Constraint: Applies a visual management prescription on 10 percent of the analysis areas in productivity classes 1 and 2 with less than 55 percent slope.
Purpose: To allow for timber management in visual corridors while meeting visual quality objectives.
Rationale: Provides for the opportunity for timber management in visual corridors.
6. Constraint: Require in the first decade a minimum of 5 MMBF/decade from timber management in visual corridors.
Purpose: To allow for timber management to occur in the visual corridors in decade one.
Rationale: The timber management prescription has a negative PNV, therefore, it must be forced into solution. The managers decided that there is an opportunity to meet visual management objectives through restricted timber management.
7. Constraint: Allows at least 50 percent of the nonstocked roaded area to be restocked.
Purpose: To eliminate cutover backlog.
Rationale: These areas are assumed to be cutover backlog. The constraint is designed to bring the areas into production.
8. Constraint: Require no more than 50 percent for a wildlife burning prescription.
Purpose: To restrict the level of burning.
Rationale: The wildlife burning prescription has a high PNV because of the elk value. Addresses the many public comments about the number of acres proposed for burning being too high. This constraint restricts the level of burning.
9. Constraint: Accesses up to 30 percent of roadless area in decade one.
Purpose: To limit access in roadless area for spatial reasons.
Rationale: An original constraint limiting access in roadless areas to 15 percent in decade 1 was re-evaluated. In the DEIS, the rationale for the 15 percent accessibility constraint was because of budget and

workforce. These are not valid constraints. As a result, the 15 percent constraint was changed to 30 percent. The 30 percent constraint is due to spatial feasibility. This constraint affects implementation and is not an administrative constraint.

10. Constraint: Applies 30 percent sequential bounds constraint.
Purpose: To allow volume to increase up to 30 percent between decades.
Rationale: In the DEIS this was 20 percent based on adding one additional sawmill in the area. The Idaho Timber Supply study indicates a dwindling industrial timber supply. The increase in this constraint allows the Clearwater to respond in decade 2 to this additional need.
11. Constraint: Applies the lower limits of timber volume to 163 MMBF/year excluding noninterchangeable volume.
Purpose: To increase harvest over Proposed Action in DEIS.
Rationale: The Idaho Timber Supply study indicated that the timber supply in Northern Idaho is not a problem in the first decade of the Plan. However, the managers decided to respond to the public comments of the DEIS to increase timber supply in the Region by increasing the limit above what was in the DEIS as long as other constraints could be met.
12. Constraint: Designates 8,292 acres to research natural areas (RNA's).
Purpose: To increase RNA acres by 7,011 over the 1,281 acres now existing.
Rationale: Addresses public comment to increase RNA acres.
13. Constraint: Applies regeneration harvest constraint in the first and second decades.
Purpose: To model spatial feasibility.
Rationale: Limits the amount of regeneration harvest that can occur due to spatial fitting.
14. Constraint: Constrains the suitable timber base to 987 M acres.
Purpose: To maintain future timber production on lands not currently cost efficient.
Rationale: Maintains the suitable base as close as possible to the level displayed in Proposed Action in DEIS. Also, allows the lands not currently cost efficient to be re-evaluated more easily if conditions change.

VIII. SUMMARY OF EFFECTS OF CONSTRAINTS, BENCHMARKS, AND ALTERNATIVES

A. OVERVIEW

The purpose of estimating and displaying these effects is to compare present net value, social and economic impacts, outputs of goods and services, and overall protection and enhancement of environmental resources. This comparative analysis, which is the basis for evaluating alternatives and selecting the Preferred Alternative, is planning steps 7 and 8. This section

focuses on the economic effects of alternatives and benchmarks. The constraints are discussed in detail in the preceding Section. The social and environmental effects are discussed in Chapters II and IV.

B. PROCESS FOR EVALUATING SIGNIFICANT CONSTRAINTS

Management objectives of benchmarks and alternatives were achieved by constraining FORPLAN as described in Section VII. The efficiency trade-offs of individual objectives can be determined by comparing the PNV which meets the objective to one which does not. The change in PNV is the efficiency trade-off of achieving a specific objective if both have efficient prescriptions and maximize PNV, and the constraints are cost-efficient.

The efficiency trade-off was not determined for individual alternative objectives because of the prohibitive costs of analyzing every constraint used to develop alternatives. But by comparing alternatives, the economic trade-offs of the groups of objectives which have the most significant impact on PNV can be determined. These efficiency trade-offs can then be compared to environmental and social consequences to help identify which alternative maximizes net public benefits.

A major factor in the economic trade-off analysis is the order in which the objectives are analyzed. For example, the economic trade-off of meeting management objectives A and B can be determined by comparing FORPLAN solutions with various combinations of the two objectives. The change in PNV due to meeting only A may be \$5 MM, and the change due to meeting only B may be \$11 MM. However, the change due to meeting both A and B will probably be less than \$16 MM. In addition, the cost of meeting objective A in one alternative will not necessarily be the same as meeting the same objective in another alternative. Therefore, the economic trade-offs discussed in this section are only relevant to the actual alternative where the objectives were analyzed.

C. TRADE-OFFS AMONG ALTERNATIVES

This section discusses the response of each alternative to issues and concerns and the economic trade-offs among alternatives. Additional discussions are provided in Chapter II, and environmental effects are discussed in Chapter IV.

1. Response to Issues

Alternatives were designed to address the major issues. A single alternative cannot fully resolve all issues because of the conflicts among issues. Table B-24 compares the response of each alternative to the major issues. A detailed discussion of issues is in Appendix A.

Table B-28 displays the trade-offs for resource outputs and effects for each alternative. Additional trade-offs among alternatives can be found in Chapter II, Table II-22.

Table B-24.

Responsiveness of Alternatives to Issues, Concerns, and Opportunities

Alternatives	A (c.d.)	B	C	D
ICO				
1. Manage visual resource on suitable timberland	58 M acres-Retention 96 M acres-Partial Ret. 724 M acres-Modification 161 M acres-Max. Mod.	0-Retention 80 M acres-Partial Ret. 876 M acres-Modification 197 M acres-Max. Mod.	300 acres-Retention 77 M acres-Partial Ret. 864 M acres-Modification 193 M acres-Max. Mod.	41 M acres-Retention 118 M acres-Partial Ret. 659 M acres-Modification 122 M acres-Max. Mod.
2. Manage for arch. and historic resources	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.
3. Establish additional special areas	Lochsa -1,281 acres	Lochsa -1,281 acres	Lochsa - 1,281 Proposed - 3,886 Total 5,167	Lochsa - 1,281 Proposed - 4,651 Total 5,932
4. Classification and management of wilderness.	Existing - 259,165 Proposed - 190,354 Total 449,519	Existing - 259,165 Proposed - 0 Total 259,165	Existing - 259,165 Proposed - 45,471 Total 304,636	Existing - 259,165 Proposed - 130,430 Total 389,595
4a. Management of unroaded areas.	A3 - 46,126 C6 - 46,600 Total 92,726	NONE	A3 - 70,685 Total 70,685	A3 - 201,320 C1 - 61,557 C6 - 30,360 Total 293,237
5. Identify candidates for Wild & Scenic River status	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.
6 & 7. Manage winter and summer range	Winter - 16,500 Summer - No minimum	Winter - No minimum Summer - No minimum	Winter - No minimum Summer - No minimum	Winter - 18,700 Summer - 21,250
8. Timber supply demand	Decade 1 180.9 MEF/Yr. Decade 15 519.1 MEF/Yr.	Decade 1 225.3 MEF/Yr. Decade 15 601.5 MEF/Yr.	Decade 1 213.1 MEF/Yr. Decade 15 592.6 MEF/Yr.	Decade 1 176.1 MEF/Yr. Decade 15 477.8 MEF/Yr.
9. Suitable and unsuitable lands	Suitable. 1041 M acres Unsuitable. 796 M acres	Suitable: 1153 M acres Unsuitable: 684 M acres	Suitable: 1134 M acres Unsuitable: 703 M acres	Suitable: 941 M acres Unsuitable: 896 M acres
10. Silvicultural systems (decade 1)	Selection. 0 Shelterwood. 2 M acres Clearcutting. 5 M acres	Selection: 0 Shelterwood: 3 M acres Clearcutting: 6 M acres	Selection. .1 M acres Shelterwood: 2 M acres Clearcutting: 6 M acres	Selection: .1 M acres Shelterwood: 2 M acres Clearcutting: 5 M acres
11. Below-cost timber sales	Will be decided through projects	Will be decided through projects	Will be decided through projects	Will be decided through projects
12. Manage watersheds and fish habitat.	Mod Fish except Min Viable D2, Low Fish roaded D1.	Low Fish except Min Viable D2.	Mod Fish except Min Viable D2, Low Fish roaded D1.	High Fish except Min Viable D2, Mod Fish Lolo Cr., Low Fish roaded D1.
13. Manage riparian areas.	Will be decided through project level.	Will be decided through project level.	Will be decided through project level.	Will be decided through project level
14. Road system development.	Decade 1 62 Mi./Yr. Decade 10 20 Mi./Yr.	Decade 1 69 Mi./Yr. Decade 10 18 Mi./Yr.	Decade 1 64 Mi./Yr. Decade 10 19 Mi./Yr.	Decade 1 62 Mi./Yr. Decade 10 17 Mi./Yr.
15. Consider an energy corridor	Might be possible after a study is conducted.	Might be possible after a study is conducted.	Might be possible after a study is conducted.	Might be possible after a study is conducted.

(Table B-24 cont.)

Responsiveness of Alternatives to Issues, Opportunities, and Concerns

Alternatives	E	E1	F	G
<u>100</u>				
1. Manage visual resource on suitable timberland	42 M acres-Retention 143 M acres-Partial Ret. 701 M acres-Modification 109 M acres-Max. Mod.	42 M acres-Retention 144 M acres-Partial Ret. 710 M acres-Modification 109 M acres-Max. Mod.	48 M acres-Retention 87 M acres-Partial Ret. 553 M acres-Modification 104 M acres-Max. Mod.	48 M acres-Retention 87 M acres-Partial Ret. 675 M acres-Modification 150 M acres-Max. Mod.
2. Manage for arch. and historic resources	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.
3. Establish additional special areas.	Lochsa - 1,281 Proposed - 4,651 Total 5,932	Lochsa - 1,281 Proposed - 4,651 Total 5,932	Lochsa - 1,281 Proposed - 7,651 Total 8,932	Lochsa - 1,281 Proposed - 3,986 Total 5,267
4. Classification and management of wilderness.	Existing - 259,165 Proposed - 188,871 Total 448,036	Existing - 259,165 Proposed - 188,871 Total 448,036	Existing - 259,165 Proposed - 297,248 Total 556,413	Existing - 259,165 Proposed - 453,997 Total 713,162
4a. Management of unroaded areas.	A3 - 73,648 C1 - 45,120 C6 - 69,700 Total 188,468	A3 - 73,648 C1 - 45,120 C6 - 69,700 Total 188,468	A3 - 88,514 C1 - 142,680 C6 - 59,280 Total 290,474	None
5. Identify candidates for Wild & Scenic River status	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.
6 & 7. Manage winter and summer range	Winter - 18,700 Summer - 21,250	Winter - 18,700 Summer - 21,250	Winter - 20,900 Summer - 23,750	Winter - No minimum Summer - No minimum
8. Timber supply	Decade 1 159.5 MEF/Yr. Decade 15 494.8 MEF/Yr.	Decade 1 145.5 MEF/Yr. Decade 15 376.3 MEF/Yr.	Decade 1 159.6 MEF/Yr. Decade 15 400.5 MEF/Yr.	Decade 1 190.9 MEF/Yr. Decade 15 490.4 MEF/Yr.
9. Suitable and unsuitable lands	Suitable: 997 M acres Unsuitable: 840 M acres	Suitable: 1008 M acres Unsuitable: 829 M acres	Suitable: 793 M acres Unsuitable: 1044 M acres	Suitable: 960 M acres Unsuitable: 878 M acres
10. Silvicultural systems (decade 1)	Selection: .1 M acres Shelterwood: 2 M acres Clearcutting: 5 M acres	Selection: .1 M acres Shelterwood: 2 M acres Clearcutting: 4 M acres	Selection: .9 M acres Shelterwood: 2 M acres Clearcutting: 5 M acres	Selection: .1 M acres Shelterwood: 2 M acres Clearcutting: 5 M acres
11. Below-cost timber sales	Will be decided through projects	Will be decided through projects	Will be decided through projects	Will be decided through projects
12. Manage watersheds and fish habitat	High Fish including Lolo & Elk Cr except Low Fish D1 roaded & Min Viable D2.	High Fish including Lolo & Elk Cr except Low Fish D1 roaded & Min Viable D2.	High Fish except Min Viable D2, Mod Fish Lolo Cr., Low Fish roaded D1.	Low Fish except Min Viable D2.
13. Manage riparian areas.	Will be decided through project level.	Will be decided through project level.	Will be decided through project level.	Will be decided through project level
14. Road system development.	Decade 1 62 Mi./Yr. Decade 10 15 Mi./Yr.	Decade 1 61 Mi./Yr. Decade 10 12 Mi./Yr.	Decade 1 55 Mi./Yr. Decade 10 13 Mi./Yr.	Decade 1 61 Mi./Yr. Decade 10 18 Mi./Yr.
15. Consider an energy corridor	Might be possible after a study is conducted.	Might be possible after a study is conducted.	Might be possible after a study is conducted.	Might be possible after a study is conducted.

(Table B-24 cont.)

Responsiveness of Alternatives to Issues, Concerns, and Opportunities

Alternatives	H	I	J	K (p.a.)
IOC				
1. Manage visual resource on suitable timberland	28 M acres-Retention - 94 M acres-Partial Retent. 457 M acres-Modification 87 M acres-Max. Mod.	13 M acres-Retention 52 M acres-Partial Retent. 395 M acres-Modification 88 M acres-Max. Mod.	41 M acres-Retention 124 M acres-Partial Ret. 666 M acres-Modification 118 M acres-Max. Mod.	36 M acres-Retention 146 M acres-Partial Retent. 694 M acres-Modification 111 M acres-Max. Mod.
2. Manage for arch. and historic resources	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.	No restrictions. Will meet legal requirements.
3. Establish additional special areas.	Lochsa - 1,281 Proposed - 7,651 Total 8,932	Lochsa - 1,281 Proposed - 7,651 Total 8,932	Lochsa - 1,281 Proposed - 4,651 Total 5,932	Lochsa - 1,281 Proposed - 7,011 Total 8,292
4. Classification and management of wilderness.	Existing - 259,165 Proposed - 715,523 Total 974,688	Existing - 259,165 Proposed - 950,311 Total 1,209,476	Existing - 259,165 Proposed - 258,289 Total 517,454	Existing - 259,165 Proposed - 198,200 Total 457,365
4a. Management of roadless areas.	C1 - 14,383 Total 14,383	None	A3 - 73,545 C1 - 65,015 C6 - 30,360 Total 168,920	A3 - 78,800 C1 - 45,100 C6 - 102,440 Total 226,340 *
5. Identify candidates for Wild & Scenic River Status	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.	Kelly Cr.-19 miles for Wild & 12 miles for Rec. Cayuse Cr.-39 miles for Scenic. NF of Clearwater River-60 miles for Scenic.
6 & 7 Manage winter and summer range	Winter - 16,500 Summer - 18,750	Winter - 13,750 Summer - 15,625	Winter - 18,700 Summer - 21,250	Winter - No minimum Summer - No minimum
8. Timber supply demand	Decade 1 138.8 MEF/Yr. Decade 15 352.0 MEF/Yr.	Decade 1 117.4 MEF/Yr. Decade 15 281.9 MEF/Yr.	Decade 1 176.2 MEF/Yr. Decade 15 480.6 MEF/Yr.	Decade 1 173.3 MEF/Yr. Decade 15 440.3 MEF/Yr.
9. Suitable and unsuitable lands	Suitable: 694 M acres Unsuitable: 1143 M acres	Suitable: 548 M acres Unsuitable: 1290 M acres	Suitable: 949 M acres Unsuitable: 888 M acres	Suitable: 988 M acres Unsuitable: 849 M acres
10. Silvicultural Systems (decade 1)	Selection: .1 M acres Shelterwood: 2 M acres Clearcutting: 4 M acres	Selection: .1 M acres Shelterwood: 1 M acres Clearcutting: 3 M acres	Selection: .1 M acres Shelterwood: 2 M acres Clearcutting: 5 M acres	Selection: 4 M acres Shelterwood: 2 M acres Clearcutting: 5 M acres
11. Below-cost timber sales	Will be decided through projects	Will be decided through projects	Will be decided through projects	Will be decided through projects
12. Manage watersheds and fish fish habitat	High Fish except Mod Fish roaded D1, Low Fish D2.	High Fish except Mod Fish roaded D1, Low Fish D2.	High Fish except Min Viable D2, Mod Fish Lolo Cr., Low Fish roaded D1.	High Fish including Lolo Cr. & Elk Cr except Low Fish D1 roaded & Min Viable D2.
13. Manage riparian areas.	Will be decided through project level.	Will be decided through project level.	Will be decided through project level.	Will be decided through project level
14. Road system development.	Decade 1 43 Mi./Yr. Decade 10 17 Mi./Yr.	Decade 1 29 Mi./Yr. Decade 10 11 Mi./Yr.	Decade 1 62 Mi./Yr. Decade 10 17 Mi./Yr.	Decade 1 59 Mi./Yr. Decade 10 12 Mi./Yr.
15. Consider an energy corridor	Might be possible after a study is conducted.	Might be possible after a study is conducted.	Might be possible after a study is conducted.	Might be possible after a study is conducted.

* Does not include Management Area C3 which totals 15,900 acres and will be managed unroaded along with these management areas for a total of 242,200 acres

2. Economic Trade-offs

The Maximum PNV Benchmark is used as the basis for comparing alternative objectives by examining the effects of the constraints. The difference between the PNV of an alternative and the PNV of the Maximum PNV Benchmark represents the reduction in PNV to the government resulting from the objectives of the alternative. Alternatives are formulated by adding additional resource requirements to reflect the objectives of the alternative. As objectives are added the PNV of an alternative may decrease. The degree to which alternatives vary in economic efficiency in achieving both priced and nonpriced objectives is the subject of the remaining section.

As constraints are added or changed in an alternative, discounted costs and benefits change. The discounted costs of an alternative represents the present value of expenditures by the government required to implement an alternative. The minimum cost for National Forest land administration is defined by the Minimum Level Benchmark. By comparing costs and benefits of alternatives, the economic consequences of the objectives and nonpriced benefits can be compared.

Table B-25 presents and compares present net value (PNV), discounted costs, and discounted benefits for each alternative, the Minimum Level Benchmark, and the Maximum PNV Benchmark. The table is derived from the economic analysis of the costs and priced benefits associated with each alternative.

In Table B-26, the alternatives are arranged in order of their increasing discounted costs. The costs include both capital investments and operation and maintenance costs. Note that total discounted costs increase among alternatives from \$365 million for Alternative I to \$528 million for Alternative E1. These extremes represent a range of \$163 million. For the same alternatives, total priced benefits increase from \$1119 million to \$1789 million, or a range of \$670 million. The present net value increases from \$754 million for Alternative I to \$1261 million for Alternative E1, a change of \$507 million (Table B-27).

Nonpriced outputs and effects along with economic criteria were evaluated to determine which alternative maximizes net public benefits. Net public benefit represents the overall value to the Nation of all benefits less all costs, regardless of whether the costs and benefits are expressed in priced or nonpriced terms. A summary of some activities, outputs, and effects which affect net public benefits is provided in Table B-28.

Following the tables are narratives which provide a discussion on PNV, discounted costs and priced and nonpriced benefits associated with timber, wilderness, and roadless areas, water quality/fishery, and wildlife.

Table B-25.

Discounted Benefits and Costs for Resource Groups *
(million dollars)

Alt./ ID Run	Present Net Value	Discounted Benefits				Discounted Costs				
		Timber	Recreation	Range	Other	Timber	Roads	Recreation	Range	Other
MAX PNV (PS2)	1320	1658	330	6	9	311	232	42	1	95
E1 (E14)	1261	1414	359	5	10	212	165	54	1	96
C (AC2)	1239	1349	375	6	12	195	168	43	1	95
B (AB4)	1232	1399	340	6	9	209	175	41	1	95
G (AG3)	1128	1216	373	5	12	178	153	49	1	96
K (pa) (K01)	1124	1199	389	6	11	168	149	25	1	137
J (AF1)	1095	1146	391	5	13	164	149	49	1	96
A (cd) (AA6)	1094	1183	371	6	12	173	160	47	1	96
D (AD4)	1089	1145	387	5	12	165	150	49	1	96
E (E13)	1054	1095	389	5	13	154	148	50	1	96
F (AF3)	1007	1029	388	5	12	148	130	52	1	96
H (AH4)	898	901	381	5	13	126	121	56	1	96
I (A16)	754	724	377	5	13	110	100	57	1	96
MINLVL (MN1)	288	0	339	0	13	.25	15	6	0	44
...

* The comparison of individual resource costs and benefits from this table can be misleading because the cost figures for an individual resource do not contain those costs that are joint costs which cannot be separated by resource and are included only in the "Other Costs" category.

Table B-26. Discounted Costs, Benefits, and Present Net Value						
Alternative	<u>Discounted Costs</u>		<u>Discounted Benefits</u>		<u>Present Net Value</u>	
	Million \$	Change	Million \$	Change	Million \$	Change
MINLVL (MN1)	64	+301	352	+767	288	+466
I (AI6)	365	+36	1119	+180	754	+144
H (AH4)	401	+26	1299	+135	898	+109
F (AF3)	427	+22	1434	+69	1007	+47
E (E13)	449	+11	1503	+46	1054	+35
D (AD4)	460	0	1549	+6	1089	+6
J (AJ1)	460	+17	1555	+16	1095	-1
A (AA6) (cd)	477	0	1571	+34	1094	-34
G (AG3)	477	+3	1605	-1	1128	-4
K (K01) (pa)	480	+22	1604	+137	1124	+15
C (AC2)	502	+20	1741	+13	1239	-7
B (AB4)	522	+6	1754	+35	1232	+29
E1 (E14)	528	+154	1789	+213	1261	+59
M.PNV (PS2)	682		2002		1320	

Table B-27. Maximum PNV Benchmark, Minimum Level Benchmark, and Forest Alternatives in Order of Decreasing Present Net Value.

	<u>MM\$ PNV</u>
Maximum PNV Benchmark	1320
Alternative E1	1261
Alternative C	1239
Alternative B	1232
Alternative G	1128
Alternative K (pa)	1124
Alternative J	1095
Alternative A (cd)	1094
Alternative D	1089
Alternative E	1054
Alternative F	1007
Alternative H	898
Alternative I	754
Min Level Benchmark	288

Table B-28. Summary of Selected Activities, Outputs, and Effects by Alternative

Alternatives	M.PNV	A (cd)	B	C	D	E	E1
PNV (MM\$)	1320.1	1093.8	1231.5	1239.1	1089.2	1053.7	1260.5
Reduction in PNV (MM\$)	0	226.3	88.6	81.0	230.9	266.4	59.6
Timber Sale Decade 1 (MMBF)	309.1	180.9	225.3	213.1	176.1	159.5	145.5
Timber LITSY (MMBF)	584.6	463.5	542.6	532.7	428.7	442.5	442.5
Timber Suitability (M Acres)	1248.5	1041.0	1153.0	1134.3	941.0	997.4	1008.2
Wildns Mgmt (M Acres)	259.2	449.5	259.2	304.7	389.6	448.1	448.1
Unroaded Mgmt (M Acres)	0	92.7	0	70.7	293.3	188.4	188.4
Water Qual/Fish Stnds for Anad Habitat (% of Watershed Acres)							
No Effect	11	28	10	11	32	33	33
High Fishable	0	0	0	0	63	66	66
Moderate Fishable	0	67	0	85	4	0	0
Low Fishable	0	4	89	3	0	0	0
Minimum Viable	89	1	1	1	1	1	1
Water Qual/Fish Stnds for Anad Habitat (% of Watershed Acres)							
No Effect	3	18	3	5	29	24	24
High Fishable	0	0	0	0	61	68	68
Moderate Fishable	0	72	0	85	2	0	0
Low Fishable	0	7	94	7	5	5	5
Minimum Viable	97	3	3	3	3	3	3
Elk Winter Habitat Improvement (Acres)	105	4184	2732	3188	3471	3438	3335
Local Forest Related Employment Decade 1 (Jobs)	5014	3383	3293	3770	3340	3132	2979
Local Forest Related Income Decade 1 (MM\$)	104.1	66.5	79.1	75.6	65.5	60.6	56.9

(Table B-28 cont.) Summary of Selected Activities, Outputs, Effects by Alt.

Alternatives	F	G	H	I	J	K (pa)
PNV (MMS)	1007.1	1127.8	898.4	753.5	1095.4	1124.1
Reduction in PNV (MMS)	313.0	192.3	421.7	566.6	224.7	196.0
Timber Sale Decade 1 (MMBF)	159.6	190.9	138.8	117.4	176.2	173.3
Timber LTSY (MMBF)	361.1	441.8	315.8	254.8	431.2	440.4
Timber Suitability (M Acres)	793.1	959.6	693.9	547.5	949.2	987.7
Wldns Mgmt (M Acres)	556.4	713.2	974.7	1209.5	517.5	457.4
Unroaded Mgmt (M Ac)	290.5	0	14.4	0	168.9	226.3
Water Qual/Fish Stnds for Anad Habitat (% of Watershed Acres)						
No Effect	39	34	45	63	32	58
High Fishable	56	0	50	32	63	42
Moderate Fishable	4	0	4	4	4	0
Low Fishable	0	65	1	1	0	0
Minimum Viable	1	1	0	0	1	0
Water Qual/Fish Stnds for Anad Habitat (% of Watershed Acres)						
No Effect	41	31	52	65	29	23
High Fishable	49	0	38	25	61	54
Moderate Fishable	2	0	7	7	2	3
Low Fishable	5	66	3	3	5	5
Minimum Viable	3	3	0	0	3	14
Elk Winter Habitat Improvement (Acres)	5388	2808	1424	218	3471	1300
Local Forest Related Employment Decade 1 (Jobs)	3132	3514	2897	2638	3340	3395
Local Forest Related Income Decade 1 (MMS)	60.6	69.4	55.2	49.2	65.5	67.1

a. Alternative A (Current Direction)

Alternative A continues current management direction as provided by the approved Multiple Use Plan, Part 1, and the approved Lowell, White Pine, and Elk River Unit Plans.

(1) Effects on PNV

Alternative A has a reduction in PNV of \$226.3 million. This decrease is primarily caused by the following constraints:

- a) setting a first decade harvest constraint of 170 MMBF/yr;
- b) designating moderate fishable on all Districts except minimum viable in the Palouse District, low fishable in the roaded portion of the Pierce District, and "no effect" in unroaded or wilderness;
- c) setting an elk winter range goal of producing at least 16,500 elk in all decades;
- d) applying an A4 and A6 prescription to all roads and trails on suitable timberlands; and
- e) designating 190,400 additional acres for wilderness management and 92,700 acres for unroaded management.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative A has a 30 percent decrease in total discounted costs because of reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional acreage being designated to unroaded and wilderness management, but the change in total discounted costs is less than one percent.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 41 percent; long-term sustained yield (LTSY) decreases by 21 percent; and suitable timberland decreases by 17 percent. The decrease in the first decade harvest is due to the first decade volume constraint. LTSY decreases for the same reasons as the reduction in PNV. The suitable timberland base declines primarily because of the wilderness and unroaded prescription constraints.

(4) Wilderness and Roadless Areas

The opportunities for wilderness recreation and the 259,165 acres of the Selway-Bitterroot Wilderness remains unchanged. Four areas are recommended for wilderness: Mallard-Larkins, 67,900 acres; Moose Mountain, 18,400 acres; Hoodoo, 100,100 acres; and Lakes Addition, 4,000 acres. The rationale for the additional 190,400 acres is to meet the public demand for wilderness.

Roadless areas that continue to be managed as unroaded include the Elizabeth Lakes area, 9,800 acres; the Lochsa Face, 36,300 acres; and the Fish Creek area, 46,600 acres. The decision was made to manage these as unroaded areas because of the direction in the unit plans and the attraction of these areas to semiprimitive motorized recreation.

(5) Water Quality/Fisheries

Fisheries habitat is managed for moderate fishable in most of the Forest. This objective declines to low fishable in the roaded portion of the Pierce District and minimum viable in the Palouse District. The lower standards are the result of trade-offs that occur between timber management and fishery goals. The Pierce and Palouse Districts have historically provided a high percentage of the timber cut (i.e., about 50 percent). This has resulted in drainages on Pierce-roaded and Palouse having low to minimum viable potential fishery. Higher fisheries goals would result in a reduced timber harvest on these Districts. Higher standards are applied in the other Districts with more valuable fisheries.

(6) Wildlife

A goal was applied on elk winter range of equal-to 16,500 elk in the first period and greater-than-or-equal-to 16,500 elk in decades 2 through 15. The goal, 16,500 elk, is an approximation of how many elk are currently in the Forest. This constraint resulted in a mixture of burning and timber management on winter range. Elk winter habitat increased over the Max PNV Benchmark, because burning produces more elk in decade one than any other prescription. Thus, to meet the 16,500 elk goal in decade one, the model chose burning over timber.

(7) Employment and Income Impacts

When compared to the Maximum PNV Benchmark, Alternative A has a decrease in employment and income of 32 percent and 36 percent respectively. This alternative ranks fifth among all alternatives in employment and income.

b. Alternative B

Alternative B is designed to produce the maximum amount of market outputs (timber and range forage) with a timber harvest schedule that does not decline from one decade to the next and does not exceed the long-term sustained yield capacity in any one decade. This alternative responds to the maximum feasible timber and range forage issues as well as the maximum road development, minerals, and roaded recreational issues.

(1) Effects on PNV

Alternative B has a reduction in PNV of \$88.6 million. This decrease is primarily caused by the following constraints:

- a) designating low fishable in all Districts except minimum viable in the Palouse District and "no effect" in the existing wilderness;
- b) accessing not more than 15 percent of the suitable roadless area in decade one; and
- c) excluding the C2 prescription from being selected.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative B has a 23 percent decrease in total discounted costs because of reduced timber harvest and fewer

roads. Recreational and wildlife costs are about the same because the designation of roadless and wilderness management are very similar between the Maximum PNV Benchmark and Alternative B.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 27 percent; LTSY decreases by 7 percent; and suitable timberland decreases by 8 percent. An earlier run was made on Alternative B without the 15 percent first decade access constraint on roadless areas and allowing the C2 prescription to be selected. This resulted in a timber harvest of 291 MMBF/yr (excluding noninterchangeable volume) in the first decade or only a 2 percent drop when compared to Max PNV. Thus the first decade timber harvest is decreased by 77 MMBF/yr with these two constraints.

The 15 percent access constraint limits the amount of acres the model can cut on roadless areas, thus reducing timber harvest. The C2 (wildlife/timber) prescription requires a higher percentage of skyline and aerial logging than E1 (intensive timber). This results in a lower PNV than E1 but at the same time this prescription requires fewer roads and therefore produces less sediment.

When fisheries is applied as a constraint on sediment, the model will designate acres to C2. This results in a decrease in PNV. However, when C2 is not allowed to come into solution, the model is forced to delay cutting on areas where sediment is constraining. This results in a decrease in the first decade harvest.

The decline in suitable acres for timber management seems to be mainly due to the 15 percent access constraint on roadless areas.

The model designated 147,557 acres to minimum level. The majority of this minimum level designation appears to be due to the access constraint causing a delayed entry in the younger stands. For example, if the model has the option of cutting a pole-timber stand at age 70, 80, 90, 100, or 110, the PNV for these 5 entries is positive at ages 70 to 90 and negative at 100 to 110. Before the 15 percent access constraint was applied, the model was cutting the stand at ages 70 to 90 and gaining a positive PNV. However, when this constraint was applied, the model delayed entry in this stand to ages 100 to 110. This entry has negative PNV's, which are more negative than minimum level. Thus the stand is designated to minimum level with an objective of maximum PNV subject to a 15 percent access constraint.

The rationale for the 15 percent access constraint on roadless areas are: a) budget ceilings and work-year-equivalents (manpower) which limit the Forest's ability to develop roadless areas; and b) the spatial distribution of sawtimber analysis areas which prohibits the large increase in area and volume accessed.

(4) Wilderness and Roadless Areas

The opportunities for wilderness recreation and the 259,165 acres Selway-Bitterroot Wilderness remains unchanged. No additional acres are designated to wilderness or unroaded management because the objective of the alternative is to maximize market outputs.

(5) Water Quality/Fisheries

Fisheries habitat is managed for low fishable except in the the Palouse District where the level is minimum viable. The objectives are lower than Alternative A (current direction) to allow for a high level of timber harvest.

(6) Wildlife

No constraints were applied to produce a minimum number of elk on winter range; yet, Alternative B still burns 2,732 acres/yr. Once again, the 15 percent access constraint on roadless areas seems to be causing the model to select the burning prescription. In an earlier Alternative B run, the model designated only 146 acres/yr to burning when no access constraint was applied. By limiting access into the roadless winter range, the model has three options in the first decade: 1) delay harvest, 2) burn, and 3) minimum level management. With Maximum PNV as the objective, burning produces a higher PNV than delaying harvest or designating a significant portion of the winter range as minimum level. This occurs because burning produces more elk, and elk from winter range are valued in FORPLAN.

(7) Employment and Income Impacts

When compared to the Maximum PNV Benchmark, Alternative B has a decrease in employment and income of 22 percent and 24 percent respectively. This alternative ranks first among all alternatives in employment and income.

c. Alternative C

Alternative C produces high levels of the market outputs, timber and range forage. This alternative provides moderate fishery and elk habitat conditions and limited nonwilderness recreation. The new wilderness recommended in this alternative corresponds to that proposed by the timber industry in Idaho.

(1) Effects on PNV

Alternative C has a reduction in PNV of \$81.0 MM. This decrease is primarily caused by the following constraints:

- a) designating moderate fishable in all districts except minimum viable in the Palouse District, low fishable in the roaded portion of the Pierce District, and "no effect" in wilderness or roadless areas;
- b) accessing not more than 15 percent of the suitable roadless area in decade one;
- c) excluding the C2 prescription from being selected; and
- d) designating 45,500 additional acres for wilderness and 70,700 acres for unroaded management.

Alternative C has a higher PNV than Alternative B. This occurs even though Alternative B harvests more timber. There appears to be two primary reasons for the higher PNV: 1) Alternative C builds fewer roads and thus has lower discounted costs and 2) Alternative C has higher water quality/fishery objectives which result in more anadromous fish and increase discounted benefits.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative C has a 26 percent decrease in total discounted costs. The reduced timber harvest and fewer roads are the main reasons for lower costs. Recreational and wildlife costs are slightly higher because of the additional acreage being designated to unroaded management, but the change in total discounted costs is less than one percent.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 31 percent; LTSY decreases by 9 percent; and suitable timberland decreases by 9 percent. The decrease in first decade timber harvest is due to the 15 percent access constraint on roadless areas, exclusion of C2 prescription, fishery objectives, and the additional wilderness and roadless acres. The suitable timberland base declines primarily because of the wilderness and roadless constraints.

(4) Wilderness and Roadless Areas

The capacity for wilderness recreation increases slightly from the present with the addition of approximately 45,500 acres of new wilderness recommended in the Hoodoo, Mallard-Larkins, Five Lakes Butte, and Lakes Addition areas. Areas that remain roadless but not recommended for wilderness are portions of Elk River, Lochsa Face, Coolwater Ridge, Elizabeth Lakes, and Moose Mountain areas totaling 70,700 acres.

The rationale for the additional 45,500 acres in wilderness is based on the timber industries' wilderness proposal. The decision was made to manage the 70,000 areas for unroaded, because the areas have a high attraction for primitive/semiprimitive recreation.

(5) Water Quality/Fisheries

Fisheries habitat is managed for moderate fishable across most of the Forest. This objective declines to low fishable in the roaded portion of the Pierce District and minimum viable in the Palouse District. They were applied to provide water quality for fish habitat to meet the intent of this alternative.

(6) Wildlife

No constraints were applied to produce a minimum number of elk on winter range. Yet like Alternative B, this alternative burns a significant number of acres. The rationale is the same as stated in Alternative B.

(7) Employment and Income Benefits

When compared to the Maximum PNV Benchmark, Alternative C has a decrease in employment and income of 25 percent and 27 percent respectively. This alternative ranks second among all alternatives in employment and income.

d. Alternative D

This alternative is designed to provide a mix of market and nonmarket outputs with the emphasis on market goods from lands suitable for that purpose. Nonmarket outputs are emphasized on lands less suitable for timber production. This alternative presents as a wilderness proposal those areas and acreages agreed to by the Idaho Congressional Delegation for the Idaho Wilderness Bill.

(1) Effects on PNV

Alternative D has a reduction in PNV of \$230.9 million. This decrease is primarily caused by the following constraints:

- a) designating high fishable except minimum viable in Palouse District, moderate fishable level in Lolo Creek, low fishable in the roaded portion of the Pierce District, and "no effect" in wilderness or roadless areas;
- b) setting an elk winter goal of at least 18,700 elk and an elk summer goal of 21,250 elk;
- c) excluding the C2 prescription;
- d) applying an A4 and A6 prescription to all roads and trails on suitable timberlands;
- e) accessing not more than 15 percent of the roadless areas in decade one; and
- f) designating 130,400 additional acres to wilderness and 293,300 acres to roadless management.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative D has a 33 percent decrease in total discounted costs because of the reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional acreage being designated to unroaded and wilderness management, but the change in total discounted costs is less than two percent.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 43 percent; LTSY decreases by 27 percent; and suitable timberland decreases by 24 percent. The first decade harvest is reduced. This is due primarily to the reduced timber base, the higher fishery objectives, 15 percent access constraint, and the exclusion of the C2 prescription. The suitable timber base declines primarily because of the wilderness and unroaded prescription constraints.

(4) Wilderness and Roadless Areas

In this alternative, approximately 130,400 acres are recommended for wilderness in Hoodoo and Mallard-Larkins areas. The new proposals, along with the existing Selway-Bitterroot Wilderness, would total about 389,600 acres of wilderness. In addition to the wilderness, approximately 293,300 acres remain unroaded for primitive recreation, watershed, and wildlife protection.

The rationale for the additional 130,400 acres of wilderness is based on Idaho's Congressional Delegation proposal. A management decision was made to manage these areas for unroaded because the areas provide a high attraction for primitive/semiprimitive recreation, and provide protection to watershed and wildlife.

(5) Water Quality/Fisheries

Fisheries habitat is maintained at higher levels than Alternatives A, B, C, and G. This constraint results in reducing the timber harvest. The exact magnitude of the decrease is not known. A separate FORPLAN run would be needed to determine this.

(6) Wildlife

The 18,700 goal on elk winter range results in 3,471 acres of burning with the rest of the winter range being designated primarily to timber management. In comparing this alternative to Alternatives B and C, only a small amount of acres (200-700 acres) are designated to burning due to the 18,700 elk goal. The remaining acres of burning are caused by the 15 percent access constraint on roadless areas as explained in Alternative B.

The 21,250 elk objective on summer range is higher than the goal on winter range. Additional habitat in summer range is needed to support the 18,700 elk on winter range, because elk need additional security and lack of disturbance on summer range. This objective results in 119,900 acres being designated to the wildlife/timber prescriptions (C2S, C6S) on key summer range instead of intensive timber. The majority of the remaining elk on summer range is produced by the unroaded prescriptions applied as constraints.

(7) Employment and Income Benefits

When compared to the Maximum PNW Benchmark, Alternative D has a decrease in employment and income of 33 percent and 37 percent respectively. This alternative is tied for sixth among all alternatives in employment and income.

e. Alternative E

Alternative E provides a mix of market and nonmarket outputs with emphasis on timber production, fishery habitat, and potential elk production. This alternative is designed to address the timber production, elk, special areas, water quality, minerals, fisheries quality, and roaded natural, primitive, and wilderness recreational issues.

(1) Effects on PNW

Alternative E has a reduction in PNW of \$266.4 million. This decrease is primarily caused by the following constraints:

- a) designating high fishable including Lolo and Elk Creeks in the Pierce and Palouse Districts except low fishable in the roaded portion of the Pierce District, minimum viable in the rest of the Palouse District, and "no effect" in wilderness or roadless areas;

- b) setting an elk winter goal of at least 18,700 elk and an elk summer goal of 21,250 elk;
- c) designating at least 236,000 acres to the C2S and/or C6S prescriptions;
- d) excluding the C2 prescription;
- e) applying an A⁴ and A6 prescription to all roads and trails on suitable timberlands;
- f) accessing not more than 15 percent of the roadless areas in decade one;
- g) designating 188,900 additional acres for wilderness and 188,400 acres for unroaded management; and
- h) applying a timber volume constraint to the roaded and roadless portion of some Districts.

(2) Discounted Costs

When compared to the Maximum PNW Benchmark, Alternative E has a 3⁴ percent decrease in total discounted costs because of reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional roadless and wilderness acres, but the change in total discounted costs is less than two percent.

(3) Timber

When compared to the Maximum PNW Benchmark, timber harvest in the first decade decreases by 48 percent; LTSY decreases by 2⁴ percent; and suitable timberland decreases by 20 percent. The first decade harvest is below Alternative D, even though Alternative D has less suitable acres, because of higher fishery objectives in Lolo and Elk Creeks and applying a timber volume constraint to the roaded and roadless portion of some of the Districts. The volume constraints are applied to spatially fit this alternative based on District and management team input.

The suitable timberland base declines primarily because of the wilderness and unroaded prescription constraints.

(4) Wilderness and Roadless Areas

This alternative proposes wilderness additions in Mallard-Larkins of 63,000 acres; Hoodoo of 100,100 acres; Elk Summit of 21,800 acres; and Lakes Addition to the Selway-Bitterroot of 4,000 acres for a total 188,900 acres. The new proposals along with the existing wilderness acreage total 448,100 acres.

In addition to the wilderness proposals certain other roadless areas remain unroaded, because they are especially suited for primitive recreation in a nonwilderness setting or for watershed or wildlife values. These areas include Elizabeth Lakes, North Lochsa Slope, South Lochsa Face, Coolwater Ridge, Moose Mountain, and portions of the Cayuse and Kelly Creek drainages.

(5) Water Quality/Fisheries

Fishery objectives are very similar to Alternative D except Lolo and Elk Creeks in the Pierce and Palouse Districts are managed for high fishable.

(6) Wildlife

The goal of 18,700 elk on winter range results in 3,438 acres/yr of burning with the rest of the winter range being designated primarily to timber management. This is about the same as Alternative D.

FORPLAN must produce at least 21,250 elk on the summer range; however, for this alternative the model never produces less than 23,400 elk. This is because over 236,000 acres is designated to the wildlife/timber prescriptions C2S and C6S. About 170,000 acres of key summer range needs to be designated to C2S and/or C6S to produce 21,250 elk. The additional 66,000 acres are necessary based on the importance of wildlife in this alternative.

(7) Employment and Income Benefits

When compared to the Maximum PNV Benchmark, Alternative E has a decrease in employment and income of 38 percent and 42 percent respectively. This alternative is tied for eighth among all alternatives in employment and income.

f. Alternative E1 (Departure)

Alternative E1 provides a variation to the DEIS's Proposed Action, Alternative E, by allowing the flexibility to depart from the requirement of a nondeclining base sale schedule. While addressing the same issues as Alternative E, this alternative also focuses on the national management concern of the effect of nondeclining yield.

(1) Effects on PNV

Alternative E1 has a reduction in PNV of \$59.6 million. This decrease is primarily caused by the following constraints:

- a) LTSY must be the same as Alternative E;
- b) the same constraints as Alternative E except the sequential bound constraint of 0 percent lower bound and 20 percent upper bound is removed; the timber harvest is allowed to fluctuate either up or down from one decade to the next.

The reduction in PNV is lower than any other alternative because timber harvest is allowed to fluctuate either up or down from one decade to the next.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative E1 has a 23 percent decrease in total discounted costs because of reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional acreage being designated to roadless and wilderness management, but the change in total discounted costs is only about two percent.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 53 percent; LTSY decreases by 24 percent; and suitable timberland

decreases by 19 percent. The first decade timber harvest is less than Alternative E, because the PNV's for most of the timber prescriptions are higher in later decades than in the first decade.

Two important assumptions are made in FORPLAN to cause the PNV to be higher: 1) the yield projections made in the timber yield tables; and 2) the real price increase assumed in the economic tables. Thus, the model is delaying cutting many of the sawtimber analysis areas until after the first decade. This can occur when nondeclining yield is no longer a constraint.

- (4) Wilderness and Roadless Areas
- (5) Water Quality/Fisheries
- (6) Wildlife

This alternative resource response is the same as Alternative E.

- (7) Employment and Income Benefits

When compared to the Maximum PNV Benchmark, Alternative E1 has a decrease in employment and income of 41 percent and 45 percent respectively. This alternative ranks tenth among all alternatives in employment and income.

g. Alternative F

Alternative F increases the emphasis on wilderness, potential elk production, and primitive recreation from Alternative E by increasing the amount of recommended wilderness to 297,200 acres and elk population to a minimum of 20,900 animals in the first decade. Market outputs from lands available for that use are at a moderate level. This alternative contains the wilderness proposed by the State of Idaho.

- (1) Effects on PNV

Alternative F has a reduction in PNV of \$313.0 million. This decrease is primarily caused by the following constraints:

- a) designating high fishable on all Districts except minimum viable in the Palouse District, moderate fish in Lolo Creek, low fish in the roaded portion of the Pierce District, and "no effect" in roadless or wilderness;
- b) setting an elk winter goal of at least 20,900 elk and an elk summer goal of 23,750 elk;
- c) excluding the C2 prescription;
- d) applying an A4 and A6 prescription to all roads and trails on suitable timberlands;
- e) accessing not more than 15 percent of the roadless areas in decade one; and
- f) designating 297,200 additional acres for wilderness and 290,500 acres for unroaded management.

- (2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative F has a 37 percent

decrease in total discounted costs because of reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional acreage being designated to roadless and wilderness management, but the change in total discounted costs is only about two percent.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 48 percent; LTSY decreases by 38 percent; and suitable timberland decreases by 36 percent. The first decade harvest is reduced below Alternative A (current direction). This is due to the reduced timber base, the higher fishery objectives, 15 percent access constraint, and the exclusion of the C2 prescription. The suitable timber base declines primarily because of the wilderness and unroaded prescription constraints.

(4) Wilderness and Roadless Areas

This alternative proposes wilderness additions in Mallard-Larkins of 65,300 acres; Hoodoo of 137,600 acres; Moose Mountain of 16,100 acres; Cayuse (Bighorn-Weitas) of 74,200 acres; and Lakes Addition to the Selway-Bitterroot Wilderness of 4,000 acres, for a total of 297,200 acres. Alternative F also maintains certain roadless areas as unroaded; these areas are important for recreation, watershed, and wildlife. Total unroaded acreage is 290,500 acres.

The rationale for the additional 297,200 acres for wilderness is based on the wilderness proposal by the State of Idaho. The management team decided to designate the 290,500 areas for unroaded management because the areas have a high attraction for primitive/semiprimitive recreation and wildlife and watershed protection.

(5) Water Quality/Fisheries

This alternative manages more habitat at "no effect" than all alternatives (except H and I) because of the large amount of acreage in wilderness and unroaded management. When "no effect" is combined with high fishable, this alternative has the same objectives as Alternative D.

(6) Wildlife

The elk goal of 20,900 on the elk winter range results in 5,388 acres/year of burning with the rest of the winter range being designated primarily to timber management. This is the highest elk number constraint of all the alternatives and results in about 1/3 of the winter range being burned. The higher the elk number constraint, the more burning FORPLAN designates to winter range. As discussed in Alternative B, about 2,000 to 3,000 acres of the burning is due to the 15 percent access constraint with an objective of Maximum PNV and not to the 19,000 elk objective.

The 23,750 elk objective on summer range results in 88,200 acres of wildlife/timber prescriptions on key summer range. This acreage is lower than Alternatives D or E which have a lower constraint. The additional elk are being produced by designating 142,700 acres of the key summer range to unroaded

management and an additional 147,800 acres on the regular summer range to unroaded management. The unroaded key summer range prescription produces more elk than any other prescription. This alternative designates twice as many acres to this prescription as the other alternatives. For this reason, it is able to produce more elk than the other alternatives.

(7) Employment and Income Benefits

When compared to the Maximum PNV Benchmark, Alternative F has a decrease in employment and income of 38 percent and 42 percent respectively. This alternative is tied for eighth among all alternatives in employment and income.

h. Alternative G

This alternative is designed to respond to the Forest Service Chief's direction to provide one alternative that has a substantial wilderness proposal while emphasizing market outputs from lands already developed for that purpose and on selected roadless lands especially suited for timber production. Alternative G also depicts the Idaho Wilderness Coalition's proposal for wilderness.

(1) Effects on PNV

Alternative G has a reduction in PNV of \$192.3 million. This reduction is primarily caused by the following constraints:

- a) designating low fishable in all Districts except minimum viable in the Palouse District, and "no effect" in wilderness or unroaded areas;
- b) accessing not more than 15 percent of the suitable roadless area in decade one;
- c) excluding the C2 prescription;
- d) applying an A4 and A6 prescription to all roads and trails on suitable timberlands; and
- e) designating 454,000 additional acres for wilderness.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative G has a 30 percent decrease in total discounted costs because of reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional acreage being designated to wilderness management, but the change in total discounted costs is less than two percent.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 38 percent; LTSY decreases by 24 percent; and suitable timberland decreases by 23 percent. When compared to Alternative B, the first decade harvest drops 32.4 MMBF/yr because of the additional 454,000 acres being designated to wilderness. The decline in LTSY and suitable timberland (i.e., 100 MMBF/yr LTSY and 193,400 acres) is also due to the additional wilderness acres.

Alternative G has only 18,600 more suitable acres than Alternative D, yet the timber harvest in the first decade is 14.6 MMBF/yr higher than Alternative D.

This higher timber harvest is a result of not applying elk constraints and having lower fishery objectives than Alternative D.

(4) Wilderness and Roadless Areas

Additions to the wilderness system recommended in this alternative include Mallard-Larkins of 109,300 acres; Hoodoo of 137,600 acres; Cayuse Creek of 71,200 acres; Fish Creek 53,800 acres; White Sand Creek of 16,900 acres; Moose Mountain 16,100 acres; Lakes Addition of 4,000 acres; Cliff-Coop. of 23,900 acres and Sneakfoot Meadows of 21,200 acres. The total wilderness recommended is 454,000 acres. This, along with the existing Selway-Bitterroot Wilderness totals 713,165 acres.

The rationale for the additional 454,000 acres of wilderness is based on the Idaho Wilderness Coalition's proposal.

(5) Water Quality/Fisheries

Except for the recommended wilderness, fisheries habitat is maintained at low fishable across most of the Forest. The objective on the Palouse District is minimum viable. The objectives are the same as Alternative B, since emphasizing market outputs (i.e., timber) on the suitable timber base is a goal of this alternative.

(6) Wildlife

No constraints were applied to produce a minimum number of elk on winter range. Yet, like Alternatives B and C this alternative burns a significant number of acres. The rationale is the same as stated in Alternative B.

(7) Employment and Income Benefits

When compared to the Maximum PNW Benchmark, Alternative G has a decrease in employment and income of 30 percent and 33 percent respectively. This alternative ranks third among all alternatives in employment and income.

i. Alternative H

Alternative H provides high levels of nonmarket goods from the undeveloped portion of the Forest by designating roadless areas to uses that restrict or prohibit road access. Market goods are produced from areas previously developed but at levels determined by the effect on other resource values.

(1) Effects on PNW

Alternative H has a reduction in PNW of \$421.7 million. This decrease is primarily caused by the following constraints:

- a) designating high fishable except moderate fishable in the roaded portions of the Pierce District, low fish in Palouse District, and "no effect" in wilderness or unroaded areas;

- b) setting elk winter goal of at least 16,500 elk and an elk summer goal of 18,750 elk;
- c) excluding the C2 prescription;
- d) applying an A⁴ and A6 prescription to all roads and trails on suitable timberlands;
- e) accessing not more than 15 percent of the suitable roadless areas in decade one; and
- f) designating 715,500 additional acres for wilderness and 14,400 acres for unroaded management.

(2) Discounted Costs

When compared to the Maximum PN^V, Alternative H has a 41 percent decrease in total discounted costs because of the reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional acreage being designated to wilderness management, with the change in total discounted costs increasing about four percent.

(3) Timber

When compared to the Maximum PN^V Benchmark, timber harvest in the first decade decreases by 55 percent; L^{TSY} decreases by 46 percent; and suitable timber base decreases by 44 percent. The first decade harvest is lower than Alternative F because of the higher fishery objectives in the roaded portion of the Pierce and Palouse Districts, and the additional 142,200 acres being designated to wilderness and unroaded management. The suitable timber base declines primarily because of the wilderness and roadless prescription constraints, although some additional acreage seems to be designated to minimum level based on the higher fishery objectives in the Palouse District.

(4) Wilderness and Roadless Areas

Wilderness proposals total 715,500 acres which expands the total wilderness to 974,700 acres. Roadless areas not recommended for wilderness are managed with emphasis on their watershed, wildlife and recreational values which on some land restricts or prohibits new road construction.

The rationale for the additional 715,500 acres for wilderness is based on what the management team felt a high amenity alternative should provide. These areas provide a high attraction for primitive/semiprimitive recreation and provide protection for watershed and wildlife.

(5) Water Quality/Fisheries

This alternative is second only to Alternative I in meeting the "no effect" objective and to Alternatives E and E1 in achieving high fishable. The impact of these high objectives is a decrease in the timber output and suitable land base.

(6) Wildlife

The 16,500 elk objective on the elk winter range results in 1,424 acres of burning and the remaining suitable winter range being designated to timber

management. Originally, Alternative H had an objective of 18,700 elk but this was unacceptable. In this alternative, a majority of the roadless winter range is being designated to wilderness management. The prescription produces very little forage when compared to burning or timber management. Thus the model was unable to produce 18,700 elk for this alternative. When the goal was dropped to 18,150 elk, the run was feasible. However to produce additional elk (20,625) on the summer range, the model needed to designate half of the suitable land base on roaded areas to minimum level.

Even by applying wilderness management to over 715,500 acres, 20,625 elk still cannot be produced. Yet if unroaded management was applied to the same acres, this objective could easily be reached. The wilderness prescription does not produce as many elk on summer range as the unroaded prescription. With unroaded management, some burning or other activities can occur on the summer range to improve habitat for the elk; whereas, the wilderness designation does not allow this option.

A final Alternative H run was developed with a 18,750 elk constraint established on the summer range and a corresponding 16,500 elk on the winter range. This resulted in an acceptable alternative.

(7) Employment and Income Benefits

When compared to the Maximum PNV Benchmark, Alternative H has a decrease in employment and income of 42 percent and 47 percent respectively. This alternative ranks eleventh among all alternatives in employment and income.

j. Alternative I

Alternative I is designed to follow the direction in the Forest Service Chief's letter of 5/31/83 which calls for one alternative that proposes all roadless areas for wilderness. It provides the maximum wilderness recreation possible along with the other associated outputs. The alternative continues market outputs at a moderate level from lands not designated to wilderness.

(1) Effects on PNV

Alternative I has a reduction in PNV of \$566.6 million. This decrease is primarily caused by the following constraints:

- a) designating high fishable in all Districts except moderate fish in the roaded portion of the Pierce District, low fish in the Palouse District, and "no effect" in roadless or wilderness;
- b) setting a goal of at least 13,750 elk on winter range and an elk summer goal of 15,625 elk;
- c) excluding the C2 prescription;
- d) applying an A4 and A6 prescription to all roads and trails on suitable lands; and
- e) managing all of the roadless areas for wilderness.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative I has a 46 percent

decrease in total discounted costs because of the reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional acreage being designated to wilderness, with the change in total discounted costs being an increase of about four percent.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 62 percent; LTSY decreases by 56 percent; and suitable timber base decreases by 56 percent. Alternative I has the lowest first decade harvest, LTSY, and suitable timber base of all the alternatives. Based on the constraints of this run, the Forest is able to cut 111.9 MMBF/yr in the first decade on the roaded areas. This is lower than the Maximum Wilderness Benchmark because of constraints on elk winter and summer range and the higher fishery objectives on the roaded areas. The suitable timber base reflects the acreage on the roaded portions of the Forest, 547,500 acres.

(4) Wilderness and Roadless Areas

New wilderness proposals in this alternative total 950,311 acres, the maximum area that can qualify for this designation. Total wilderness, including the existing 259,165 acre Selway-Bitterroot Wilderness, is 1,209,476 acres.

The rationale for managing all of the roadless areas as wilderness is based on the Chief's letter of 5/31/83 calling for one alternative that proposes all roadless areas for wilderness.

(5) Water Quality/Fisheries

This alternative is the highest of all alternatives in meeting the "no effect" objective. The remaining objectives on the roaded areas are the same as Alternative H.

(6) Wildlife

The 13,750 elk objective on the winter range results in 218 acres/yr of burning and the remaining suitable winter range being designated to timber management. This is the most elk the model is able to sustain on roaded winter range with the roadless winter being designated to wilderness. The acres of burning are the lowest of all the alternatives because Alternative I has the lowest amount of winter range where this prescription can be applied. FORPLAN runs made with higher elk winter objectives were infeasible.

The corresponding 15,625 elk constraint on summer range was not constraining and did not affect the solution of the model. The model was able to sustain 15,800 elk on the summer range by designating the majority of the roaded summer range to intensive timber management and the roadless summer to wilderness.

(7) Employment and Income Benefits

When compared to the Maximum PNV Benchmark, Alternative I has a decrease in employment and income of 47 percent and 53 percent respectively. This alternative ranks twelfth among all alternatives in employment and income.

k. Alternative J

This alternative is similar to Alternative D in outputs and effects but differs in the amount of roadless area recommended for wilderness and available for timber production. Alternative J addresses timber production, elk, special areas, water quality, minerals, fish habitat quality, and unroaded recreational issues.

(1) Effects on PNV

Alternative J has a reduction in PNV of \$224.7 million. This decrease is primarily caused by the following constraints:

- a) designating high fishable in all Districts except minimum viable in the Palouse District, moderate fishable in Lolo Creek, low fishable in the roaded portion of the Pierce District, and "no effect" in unroaded or wilderness;
- b) setting a goal of at least 18,700 elk on winter range and an elk summer goal of 21,250 elk;
- c) excluding the C2 prescription;
- d) applying an A4 and A6 prescription to all roads and trails on suitable timberlands;
- e) accessing not more than 15 percent of the roadless areas in decade one; and
- f) designating 258,300 additional acres for wilderness and 168,900 acres for unroaded management.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative J has a 33 percent decrease in total discounted costs because of the reduced timber harvest and fewer roads. Recreational and wildlife costs increase slightly because of the additional acreage being designated to wilderness management, with the change in total discounted costs being less than two percent.

(3) Timber

When compared to the Maximum PNV Benchmark, timber harvest in the first decade decreases by 43 percent; LTSY decreases by 26 percent; and suitable timberland decreases by 24 percent. The first decade harvest is the same as Alternative D, because of similar constraints. The only difference in the constraints is the wilderness and roadless acres. Yet, when the total wilderness and roadless acres are compared, the difference is very slight.

(4) Wilderness and Roadless Areas

Wilderness proposals in this alternative total 258,300 acres in the following areas: Mallard-Larkins, 63,000 acres; Hoodoo, 120,000 acres; Cayuse-Toboggan, 50,000 acres; Lakes, 4,000 acres; and Elk Summit, 21,300 acres. Total existing and recommended wilderness is 517,500 acres or approximately 27 percent of the Forest. Some roadless areas not recommended for wilderness remain unroaded for watershed protection, wildlife, or primitive recreation. This alternative contains the wilderness proposal agreed upon by local elected officials.

(5) Water Quality/Fisheries

Fishery objectives are the same as Alternative D.

(6) Wildlife

The 18,700 elk objective on winter range results in 3,471 acres of burning with the rest of the winter range being designated primarily to timber management. This is the same as Alternative D.

The 21,250 elk objective on summer range results in 151,800 acres being designated to the wildlife/timber prescription on key summer range. This is 31,900 acres more than Alternative D even with the same elk summer objective. The reason for this is the additional wilderness in Alternative J when compared to Alternative D. Wilderness does not produce as many elk as unroaded management; therefore additional acres of wildlife/timber are needed to meet the same elk objective as Alternative D.

(7) Employment and Income Benefits

When compared to the Maximum PNV Benchmark, Alternative J has a decrease in employment and income of 33 percent and 37 percent respectively. This alternative is tied for sixth among all alternatives in employment and income.

1. Alternative K (Preferred Alternative)

This alternative was developed after public review of the Draft EIS and incorporates suggestions made in the public comments. As a result, costs, benefits, activities, and outputs were reviewed. In many cases, changes were made and relationships in FORPLAN were modified by changing constraints or adding new ones. A summary of these changes appears in Chapter I and Section VII, C, in this Appendix.

Alternative K provides a mix of market and nonmarket outputs. The amount of recommended wilderness is increased over the Proposed Action of the DEIS, Alternative E.

(1) Effects on PNV

Alternative K has a reduction in PNV of \$196.0 million. This decrease is primarily caused by the following constraints:

- a) designating high fishable in all Districts including Lolo and Elk Creek, moderate fishable in Beaver Creek, low fishable in the roaded portion of Pierce, minimum viable on the Palouse, and "no effect" in unroaded and wilderness;
- b) excluding C2 prescription;
- c) accessing not more than 30 percent of the roadless areas in decade one;
- d) designating 198,200 acres for recommended wilderness and 226,340 acres for unroaded management;
- e) applying A4 and A6 prescriptions to visual corridors;

- f) maintaining roaded, seedling-sapling condition class on less than 55 percent slope in the base;
- g) lowering the limit of timber volume in decade one;
- h) maintaining the suitable timber base at 987 M acres; and
- i) applying spatial feasibility constraint.

In addition, the revisions made to FORPLAN and the costs and benefit will have an affect on PNV. For an estimate of the relative impact of these changes, review Section VIII, E, in this Appendix.

(2) Discounted Costs

When compared to the Maximum PNV Benchmark, Alternative K has a decrease in total discounted costs of \$202.2 million or 30 percent. This reduction in costs is due to decreases in discounted cost in timber and roads because of reduced levels of timber harvest. Recreational, wildlife, and other discounted costs as an aggregate increase due to the increase in nonmarket outputs. Some changes also occur due to changes in model formulation.

(3) Timber

Comparing Alternative K to the Maximum PNV Benchmark timber harvest decreases by 44 percent in the first decade; LTSY decreases by 25 percent; and suitable acres decrease by 21 percent. Alternative K ranks fourth among the twelve alternatives for harvesting timber in decade one and ranks sixth in suitable acres.

(4) Wilderness and Roadless Areas

Wilderness proposal in this alternative total 198,200 acres. Total existing and recommended wilderness is 457,365 acres or 25 percent of the Forest. Some roadless areas not recommended for wilderness remain unroaded for fisheries, wildlife, and primitive recreation, this totals 226,340 acres in Alternative K. As a result, Alternative K ranks sixth in the production of wilderness recreation by decade five and ranks second in the production of semiprimitive recreation in decade five.

(5) Water Quality/Fisheries

This alternative ranks second behind Alternative I in meeting the "no effect" water quality/fishery objective. Alternative K ranks seventh among the twelve alternatives for the high fishable objective. The result of this, in terms of potential anadromous fish production, Alternative K ranks fifth overall in both the production of steelhead and chinook smolts by decade five.

(6) Wildlife

A major comment by the public in the review of the Draft EIS was the high amount of wildlife burning proposed. As a result, this was re-examined and revised between the Draft and Final EIS.

Both spring and fall burning are allowed in Alternative K. This results in a decreased of burning on winter range. By utilizing fall burning the long-term

effect of burning results in increased elk production. By decade five, Alternative K ranks number one among all alternatives in producing elk.

(7) Employment and Income Benefits

When compared to the Maximum PNV Benchmark, Alternative K has a decrease in employment and income of 32 percent and 36 percent respectively. This alternative ranks fourth among all alternatives in employment and income.

3. Proclaimed Forest

Section 13(a) of the National Forest Management Act of 1976 requires the calculation of sustained yield on individual proclaimed National Forests. This analysis was performed for the Preferred Alternative and the details of this analysis are available in the Forest planning records. Tables B-29 and B-30 display long-term sustained yield, suitable acres, and allowable sale quantity for the proclaimed Clearwater National Forest and that portion of the St. Joe National Forest administered by the Clearwater.

Table B-29. Long-Term Sustained Yield (LTSY) and Suitable Acres

PROCLAIMED FOREST	SUITABLE ACRES	LTSY MMCF/DECADE
Clearwater	843.4	826.2
St Joe	144.6	141.6
TOTAL	988.0	967.8

The figures displayed for the Proclaimed Clearwater appear as departures. This happens because the Proclaimed Clearwater Forest figures are the difference between the Clearwater administrative Forest and that portion of the St. Joe National Forest administered by the Clearwater. The suitable acres for the Clearwater and the portion of the St. Joe administered by the Clearwater are included in FORPLAN. The administrative Clearwater Forest allowable sale quantity does not depart from a base sale schedule. The remaining portion of the St. Joe is managed by the Idaho Panhandle National Forest.

Table B-30.

Allowable Sale Quantity
(Cubic Feet)

	Clearwater Admin National Forest	Proclaimed Clearwater N.F.	Portion of the Proclaimed St Joe N.F.
Decade 1	381.0	296.6	84.4
2	466.0	358.3	107.7
3	602.4	581.1	21.3
4	783.0	314.6	468.4
5	967.8	859.0	108.8
6	967.8	939.2	28.6
7	967.8	755.1	212.7
8	967.8	892.1	75.7
9	967.8	664.1	303.7
10	967.8	916.3	51.5
11	967.8	606.9	360.9
12	967.8	858.9	108.9
13	967.8	921.4	46.4
14	967.8	780.4	187.4
15	967.8	870.5	97.3

D. TIMBER SUPPLY/DEMAND AND TIMBER RESOURCE LAND SUITABILITY

During the review of the DEIS, respondents raised questions about the timber supply and what effect changes in demand would have on the Proposed Action. New information became available between the DEIS and FEIS from the Forest Service's study, A Report on Idaho's Timber Supply. Respondents asked why lands in the suitable base were at the level stated in the Proposed Action. The timber industry and others asked about possible opportunities for increasing the allowable sale quantity (ASQ) in the Proposed Action if the demand (price) for wood were to dramatically increase. Further analysis was done both to incorporate the information from the Idaho Study and to respond to the public comments.

1. Timber Supply/Demand

Supply studies have been completed in both Idaho and Montana examining various timber supply scenarios by ownership categories. In both States the major findings of the studies indicate that for northern Idaho and western Montana the supply of timber is adequate for the next 10 years (1988-1997). This is based on the planned harvest levels of the preferred Forest Plan alternatives and the continuation of the historic harvest level of other timber ownerships.

A supply and demand analysis for the Clearwater National Forest was completed using information developed from A Report on Idaho's Timber Supply study and demand projections based on work done for the 1980 Resource Planning Act Assessment (Adam and Haynes, 1980).

A range of potential demand for the Clearwater National Forest timber was developed from the Statewide study by comparing the expected quantity supplied and demanded with a range of possible future harvests from other ownerships. This range of potential demand was then compared directly with planned harvest levels of the Preferred Alternative for the Clearwater. See Chapter II, Section D(9) for additional information on timber supply and demand.

Using the above procedure, the range of potential demand of timber from the Clearwater National Forest in 1988 to 1997 was estimated to be between 114 MMBF and 152 MMBF annually. By 2028 (Decade 5), the potential demand range for the Clearwater was 324 MMBF to 341 MMBF per year. Comparing planned and projected harvest levels of the Clearwater's Preferred Alternative (Figure B-1) to the range of potential demand for the Forest planned harvest is within or above the range of potential demand through the fifth decade.

It is important that the information on potential supply and demand be considered only as a reference point. The range of potential demand levels for individual National Forests is dependent on the supply assumptions for other ownerships and adjacent National Forests.

2. Timber Resource Suitability

Further analysis was done on the amount of suitable acres in the Preferred Alternative as shown in Table B-33. Table B-34 provides the definitions for the terminology used in Table B-33. Tentatively suitable timberlands were identified in Section II of this Appendix. This land suitability table further classifies the tentatively suitable lands into suitable and tentatively not appropriate.

The suitable category is further subdivided into the following three categories: 1) direct benefits exceed direct costs, 2) direct costs exceed direct benefits which includes meeting nontimber multiple-use objectives, and 3) local jobs and income. The cost-efficient category represents those acres and volume having a positive present net value over the planning period. On the Clearwater National Forest, this represents about 85 percent of the total suitable acres and 77 percent of the acres harvested in decade one. The average annual allowable sale quantity (ASQ) in the cost-efficient category in decade one is 1308 MMBF or 75 percent of the total ASQ.

It is difficult to separate multiple-use objectives and local jobs and income since the effects are interrelated. Therefore, information for these two categories are grouped together in Table B-33. These two categories account for 15 percent of the total suitable acres and 23 percent of the acres harvested in decade one. The average annual ASQ in decade one resulting from multiple-use objectives and local jobs and income is 425 MMBF or 25 percent.

The 147,591 acres identified in Table B-33 where direct costs exceed direct benefits occur by the following breakdown as displayed in Table B-31.

Table B-31. Breakdown of Direct Cost Exceeding Direct Benefits

Category	Acres	Percent
Nonstocked Condition Class	47,882	32
Productivity Class 3	37,089	25
Seedling-Sapling Condition Class	15,510	11
Visual Timber Management Prescription	13,741	9
Aerial Timber Management Prescription	5,572	4
Others	27,797	19
Total	147,591	100

Direct costs exceed direct benefits on these lands because of: 1) the high cost of restocking nonstocked lands, 2) productivity class 3 represents the lowest productivity class from which timber is harvested, 3) visual/timber management prescriptions have high costs and low harvest volumes because of visual quality objectives, and 4) the aerial timber management prescriptions occur on steep slopes with high logging costs. The remaining 19 percent occur on a variety of lands and are negative largely because of the period of harvest.

Of the 2,521 acres harvested annually in decade one, where direct costs exceed direct benefits, all but the 125 acres of visual/timber management prescription which is implemented annually in decade one could have direct benefits in excess of direct costs if harvested in a later decade. These areas are harvested in decade one as a result of constraints applied in Alternative K, the Preferred Alternative.

In the Preferred Alternative no lands are identified as not cost efficient to meet objectives where future timber production is possible. All potential acres were placed in the tentatively suitable base. This is a change from the DEIS's Proposed Action, which had 39,728 acres identified in this category.

There are 348,103 acres identified to meet multiple use objectives which preclude timber production. The following table displays a breakdown of acres (by acre) which are identified in this category.

Table B-32. Summary of Acres which Preclude Timber Production

OTHER USES - UNROADED Acres

The following areas will be managed for dispersed recreation in a semiprimitive setting:

Elizabeth Lakes	9,800
Lochsa Face	22,500
Coolwater	4,500
North Lochsa Slope	25,800

The following area will be managed for key big game summer range/dispersed recreation in a semiprimitive setting:

Fourth-of-July	45,100
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The following areas will be managed for key fishery habitat protection/dispersed recreation in a semiprimitive setting:

Kelly Creek	2,960
Toboggan-Cayuse-Monroe	56,780
Rabbit/Colt Creek	12,000

TOTAL	226,340
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OTHER USES PROPOSED RESEARCH NATURAL AREAS

Aquarius	3,900
Bald Mountain	370
Bull Run	373
Chateau Falls	220
Four-Bit	330
Sneakfoot	1,870
TOTAL	7,063

RECOMMENDED WILDERNESS

Mallard-Larkins	66,700
Hoodoo	113,000
Selway-Bitterroot Wilderness Addition	18,500
TOTAL	198,200

* A total of 83,500 acres of not-suited acres are subtracted from the unroaded acres (226,340); RNA's (7,063); and recommended wilderness acres (198,200) to arrive at the total net acres of 348,103.

The following narrative provides the rationale for tentatively unsuitable land assignment in the other uses category.

The acres in Elizabeth Lakes, Lochsa Face, Coolwater and North Lochsa Slope are designated for dispersed recreation in an unroaded (semiprimitive) setting on the basis that this is the highest and best use. These areas also maintain key elk habitat in natural conditions. No roads will be constructed in these areas.

The acres in the Fourth-of-July Creek area are designated for maximum protection and management of big game, primarily elk. The area was selected on the basis of elk habitat being the best and highest use. This use was strongly favored by public comments including the Idaho Fish and Game Department before the Draft and between the Draft and Final Plan. No roads will be constructed or timber management activities scheduled.

The acres in Kelly Creek, Toboggan-Cayuse-Monroe, Rabbit, and Colt Creeks are designated for maximum protection of fishery habitat. The areas were selected on the basis of being vital to the continued production and improvement of both resident fish (westslope cutthroat trout) and anadromous smolts (steelhead trout and chinook salmon). Much public interest has been shown in these areas throughout the Forest planning process. These areas also maintain key elk habitat in natural conditions. No roads will be constructed or timber management activities scheduled.

To evaluate the effect of constraining the 226,340 acres to multiple use objectives which preclude timber harvest (other uses), a sensitivity run was made using FORPLAN. This run had all constraints that applied to Alternative K (Preferred Alternative) except the acres which were constrained to preclude timber production were allowed to receive a timber prescription. The result was no change in first decade ASQ. PNV increased by ten percent, LTSY increased by five percent, and the suitable base increased by six percent over Alternative K. This indicates that while a higher PNV can be attained by allowing these lands to go to a timber prescription, first decade ASQ is not affected. The reason PNV is increased is due to rescheduling of harvest in later decades and the scheduling of harvest on some lands with high PNV that were precluded from timber harvest in Alternative K.

Figure B-2 shows a comparison of the commercial Forest land classification used in previous Forest timber management plans and the timber resource land suitability classification for the Preferred Alternative (K).

Table B-33.

TIMBER RESOURCE LAND SUITABILITY CLEARWATER NATIONAL FORESTS

NOT SUITED		ACRES		Definitions: (See Attached Sheet)		
Not Capable & Non Forest		172,151		Note: * Volume figures include: ~ Chargeable Volume Only ~ Non-Interchangeable components to meet management objectives		
Irreversible Soil and Watershed Damage		0				
No Assurance of Adequate Restocking		51,997				
Withdrawn from Timber Production		276,894				
Subtotal of Above		501,042				
SUITABLE				EFFECTS		
* LANDS COST EFFICIENT				1st Decade		LTSY
				Acres	MMBF	MMBF
		Direct Benefits Exceed Direct Costs	840,380	8,671	131	-
		Direct Costs Exceed Direct Benefits				
		Meet Non Timber M.U. Objective	147,591	2,521	42	-
		Local Jobs/Income	Included in the line above			
		Subtotal of Above	987,971	11,192	173	440
				RESOURCE OPPORTUNITY		
				1st Decade		LTSY
				Acres	MMBF	MMBF
Lands Not Cost Efficient to Meet Objectives- Future Timber Production Possible	0	0	0	-		
Multiple-Use Objectives Preclude Timber Production						
Other Uses	209,878	-	-	-		
Proposed Wilderness	138,225	-	-	-		
Subtotal of Above	348,103	0	0	-		
TOTAL NATIONAL FOREST LANDS		1,837,116				

Effective Period: from 1987 thru 1996

Table B-34.

TIMBER RESOURCE LAND SUITABILITY DEFINITIONS

NOT SUITED LANDS	
Not Capable	Forest land not capable of producing industrial wood. Quantitatively defined as lands not capable of producing 20 cubic feet of wood per acre per year
Non-Forest	Land that is not at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and currently developed for non-forest use 36 CFR 219 14(a)(1)
Irreversible Soil & Watershed Damage	36 CFR 219 14(a)(2)
No Assurance of Adequate Restocking	36 CFR 219 14(a)(3)
Withdrawn from Timber Production	36 CFR 219 14(a)(4)
TENTATIVELY SUITABLE LANDS	
SUITABLE PORTION	
Direct Benefits Exceed Direct Costs	<p>Direct benefits expressed as expected gross receipts to the government. Expected receipts are based upon expected stumpage prices and payments-in-kind from timber harvest considering future supply and demand situation for timber and upon timber production goals of the Regional Guide 36 CFR 219 14(b)(1)</p> <p>Direct costs include the anticipated investments, maintenance, operating, management, and planning costs attributable to timber production activities, including mitigation measures necessitated by the impacts of timber production 36 CFR 219 14(b)(2)</p>
Meet Non-timber, Multiple-Use Objectives	Lands where timber production is necessary to achieve non-timber, multiple-use objectives even though direct timber production costs exceed expected gross receipts to the government. These objectives are not assigned monetary values but are achieved at specified levels in the least cost manner. See 36 CFR 219 14(c) and 36 CFR 219 3 (definition of cost efficiency)
Local Jobs/Income	Lands necessary for timber production in order to maintain an appropriate level of local employment and income. (No direct basis in the planning regulations, See 36 CFR 221 3(a)(3).)
Non-Interchangeable Component	<p>The Non-Interchangeable Components are increments of volume from the suitable land base or type of timber harvested from that base that are needed to meet management objectives. The total ASQ is derived from the sum of the timber volumes from all the Non-Interchangeable Components. These increments cannot be substituted for each other for the purpose of programming harvest. Non-Interchangeable Components may be identified as parcels of land differentiated for purposes of forest plan implementation. Some conditions used to describe/differentiate these Non-Interchangeable Components are</p> <ul style="list-style-type: none"> - species marketability - whether it is dead or live - size class - operability
NOT SUITED PORTION	
Lands Not Cost Efficient to Meet Objectives-Future Timber Production Possible	Lands not currently cost efficient for timber production but which could be brought into production if conditions change. These lands represent additional opportunities within the preferred alternative.
Multiple-Use Objectives Preclude Timber Production	Based upon a consideration of multiple-use objectives for the alternative, the land is proposed for resource uses that preclude timber production 36 CFR 219 14(c)(1)

FIG. B-1. HISTORIC AND PROJECTED VOLUME
CLEARWATER NATIONAL FOREST

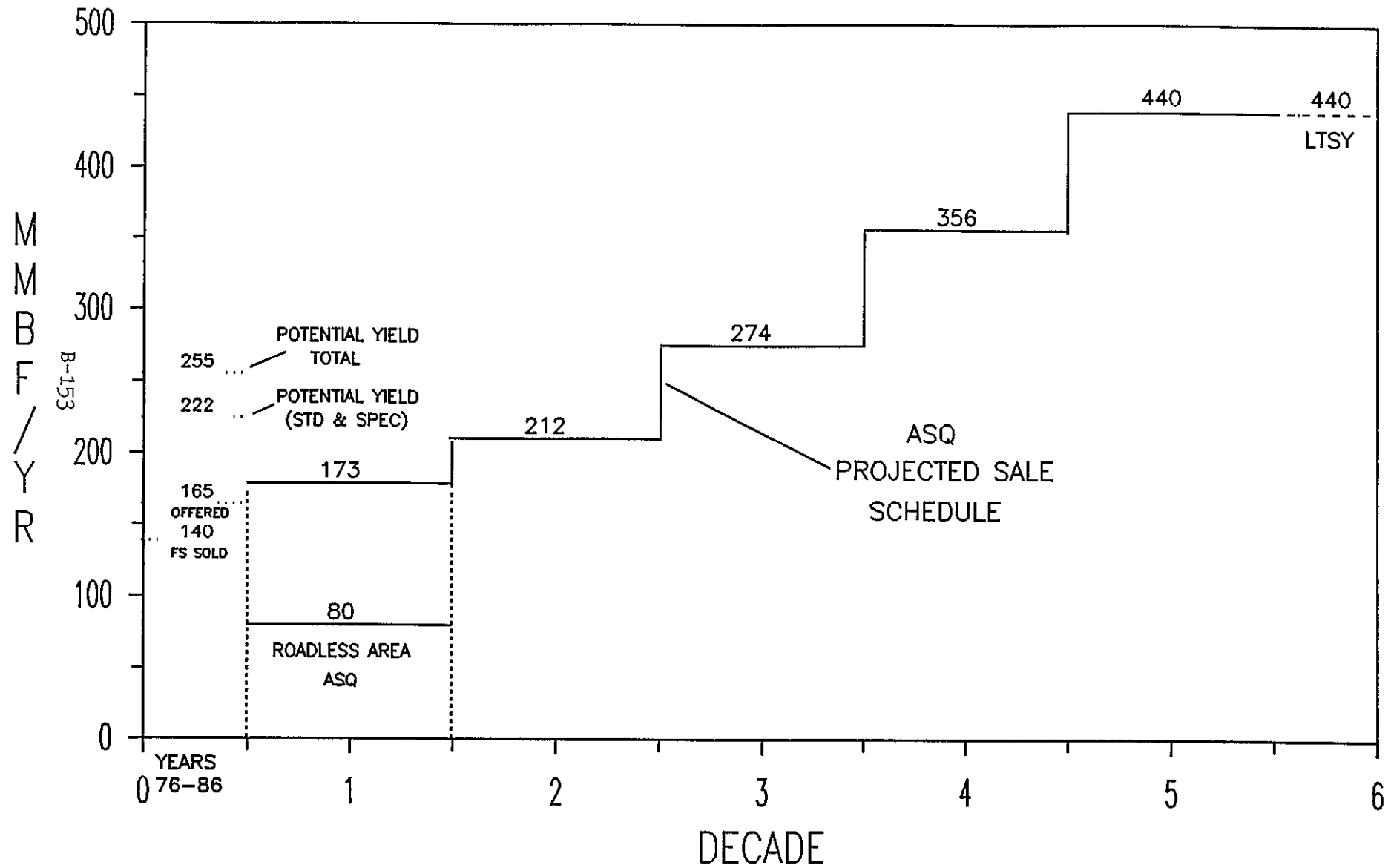


FIG. B-2. CURRENT AND PREVIOUS CLASSIFICATION
OF CLEARWATER NATIONAL FOREST LANDS

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